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INSTRUCTION TO THE INVALID

ON

THE NATURE OF

THE WATER CURE,

IN CONNECTION WITH

*The Anatomy and Physiology of the Organs of
Digestion and Nutrition.*

BY JONAH HORNER, M. D.

Licentiate of the Royal College of Surgeons, and Fellow
of the Royal Medical Society of Edinburgh, &c.

Man! know thyself: all wisdom centres there.

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INTRODUCTION.

THIS brief treatise has been composed chiefly for the instruction of the non-medical reader, and the Water Patient. The object of its publication was repeatedly suggested to the mind of the author, during his residence of nearly three years at Malvern, spent in occupation with the Water Cure. His own experience of its efficacy, in restoring him, through Divine blessing, to health and strength he expected not again to enjoy, led him to wish that a correct knowledge of its principles were more within reach of non-professional readers, and especially of invalids; and this wish, and the desirableness of its attainment, were frequently confirmed in his professional interviews with the numerous patients who afterwards came under his care. There are already a few larger and excellent works on the subject, by intelligent professional authors; yet, it has been continually urged on his attention, that a want is not fully supplied, in respect of a volume more exclusively adapted for the instruction of the Water patient. This brief treatise is intended, and its whole internal arrangement, material, and conciseness, have been designed for the purpose.

There is obviously a great advantage to be gained by the patient, in his knowledge of the essential principles of his treatment, and of the operation of the different processes. It will conduce to his more rapid recovery, and with more mutual





perfection, in the Sacred Scriptures. Second to this, in real value and importance, stands the knowledge which man ought to obtain of his own corporeal mechanism, in the study of Anatomy and Physiology; and of the laws of health and disease: and without doubt, no other knowledge, or mental exercise, can be compared with this, in its legitimate tendency to deepen the impression of the former and primary one of the soul's great interest; and to guard it from such as may be false and delusive, and received from intercourse with mankind. The study of these sciences greatly tends to fix on the mind, the declarations of the Scriptures, respecting the perfect and glorious attributes of God, and to deepen its devout feelings.

This brief work has been composed under the sincere persuasion, that it is in advocacy of truth and science; also, under a sense of incumbent duty to suffering humanity. After ample experience of the efficacy of the Water Cure, in the diseases of the human body;—after much and earnest reflection respecting it and other modes of treatment, it is my firm belief, that it is the system of Therapeutics, or cure, which excels all others:—that it is based on the strict principles of Physiology and Pathology;—in accordance with the known laws of health and disease, and with the established facts of their operation;—as to entitle it to the rank and name of an inductive science of cure, beyond any other hitherto propounded.

My chief aim has been, to give a concise explanation of its principles and practice, which are of fundamental importance;—which constitute its scientific basis, and the principal instrumentality of its power. I have aimed at the production of what will be most useful for the class of readers I have more especially in view—the non-medical, and the water patient. I have drawn from any source of knowledge before me, for the attainment of my

object: yet, my own practice and experience have been, necessarily, of the greatest aid to me; and I have stated the opinions which they have taught me: these are, essentially, in accordance with what are also taught in the published works of the most intelligent, and professional writers on Hydropathy. I shall rejoice to have placed them in a light more conspicuous, and more intelligible; or if I have given them a position, in any degree, more prominent, by the addition of my testimony, and of my experience of their correctness.

As a system of Hygiene, or of preserving health, and as an auxiliary remedy against disease, the use of water, and of baths, has been practised in this, and in other countries of the world, from the earliest ages. Warm and cold bathing were in great repute, among eastern nations,—among the Jews, and the Medes, and Persians, and the people of Lesser Asia. Among the ancient Greeks, baths were prescribed in the treatment of diseases, by Hippocrates. By Plato, the philosopher, the cold bath, with exercise, was also strongly recommended, and was practised by himself and his disciples, for restoring vigor to mind and body. With the Romans, bathing was brought to a system of Hygiene, and of luxury, as well as of treatment in disease: Celsus makes constant reference to it. Numerous are the authors, ancient and modern, who have written on the subject. Yet, the Water Cure,—the curative system, as at present established in this, and other continental countries, and largely in America, is a modern discovery; and the sole honour of it belongs to Vincent Priessnitz, a Silesian farmer—the peasant philosopher. Such is the naked, and undeniable truth; however offensive it may be to our professional dignity.

Dr. Wilson introduced the Water Cure at Malvern, from Grœfenberg, in 1842. Other practitioners afterwards commenced at that

place : and as a consequence, Hydropathic Establishments were also erected in other parts of England; of these, the principal one is that at Benrhydding, in this county, and now under the able superintendence of Dr. Mc. Leod : others also were erected in Scotland, and in Ireland. At these institutions, a great amount of benefit is continually obtained, by those who are afflicted with the severest chronic diseases ; and remarkable cures are effected by water treatment. It has certainly undergone some modification, in the hands of the experienced professional men who practise it ; yet, this has been principally in the degree of its application ; and in its more strict accordance with the teachings of Physiology and Pathology. The processes, which constitute its great means, continue essentially the same, and will remain, as the inventive genius of Vincent Priessnitz left them to us. In Dr. Wilson's very valuable work, lately published,* there is an interesting allusion to Priessnitz, and his practice, which he witnessed :—interesting to the admirers of true genius, and of the benefactors of mankind : but, withal, affording an ever seasonable lesson on the vanity of all earthly prosperity : and whilst stating Priessnitz's deficient knowledge of the elementary principles of science, he also testifies of the successful struggles of his innate genius under it. There is, to every right mind, much more of real merit, and calculated to attach one to him, in that practice under such disadvantages, than there is, to prejudice one against him, in the sneer of those who have so much opposed and reviled him, and the philosophic system of treatment which he established.

Ever since the creation of man, has truth, in its most valuable kinds, met with his opposition : yet, it will ever prevail. Innumerable are the instances of this, when it has been introduced in

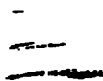
*"The Principles and Practice of the Water Cure ; and Household Medical Science : In conversations on Physiology, on Pathology, or the nature of Disease and on Digestion, Nutrition Regimen and Diet. By Jas. Wilson, M.D.&c. London ; John Churchill, Princes Street, Soho ; and Lamb, Malvern.

innovation to long established error ; as is abundantly testified in the history of science, and of the progress of the human mind ; and every sincere lover of truth and science must revert, with painful feelings, to recollections of the past. The contemplation must tend to assure him of the unreasonableness, and something worse, of men of the most cultivated intellect, when circumstances give full play to the predominant qualities of the heart. Contrary to the tenets of philosophy "falsely so called," and of pseudo-philanthropy, it is the infallible dictum of the inspired volume, "*The heart of man is deceitful above all things, and desperately wicked.*" It is the heart, which ever leads the head into error, in such matters as these ; and, indeed, in all the concerns of this life. The Water Cure not only opposes the prejudice and credulity of society in general, respecting the treatment of diseases, but it will be supposed to clash with that party interest, whose promptings are so strong, to resist whatever interferes with it. It is lamentable to notice in publications of professional men, that which is so unreasonable, against Water treatment : and that that which is ever the hackneyed course of the weak, has been so much pursued in regard to it—the *argumentum ad hominem*, so often used in opposition to truths that become innovations,—when in themselves unassailable, their advocates are assailed with abuse and invective. Often as the fact has been referred to, by previous advocates of Hydropathy, we repeat it, that the great Harvey got his share of such treatment ; and notwithstanding his demonstrations of the truth of his discovery—the circulation of the blood. He was persecuted much, because of it : it was an innovation ; and it removed the very foundation of many finely spun theories, and imaginings, about animal spirits in the arteries, and about night circulation, and day circulation, and so on : and the sapient doctors of the day

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often impressed, as to the need of further publication on the subject; and I hope, that, in some measure, I supply a want, by composing this brief and imperfect treatise.

Notwithstanding the present rather adverse circumstances, in connection with this system of treatment, it is the confident anticipation of those who understand it, that it has, ere long, and by general consent, to take its place amongst the great discoveries of modern times. It is supported by the acknowledged principles of vital chemistry, and of disease; and the ascertained facts of Physiology and Pathology. It is a proved and efficient agency, to fulfil the purposes of treatment indicated by our known laws of the human system. This has been again and again demonstrated, by the cases of cure, and by those of relief of the incurable.

Far is it from my wish, as it would be in violence of my convictions, to indulge in unreasonable censure, as some non-medical, and self-constituted censors have done, of all use of medicines in the treatment of disease. In common parlance, the *use* and the *abuse* of these are distinct points. The one to be avoided, is the use of medicines without any fixed principle of cure, beyond the *je ne sais quoi* of the mixture, or pill, to cure the complaint;—the empirical notion of the multitude, and which ascribes to drugs what belongs exclusively to *the innate power of the organism*, to correct its own disordered conditions—to cure its own diseases. Medicines may be, in certain states of the body, and under certain circumstances, very valuable aids, or remedies: but they should always be administered on the principles of Physiology and Pathology, which constitute the only true basis of scientific treatment.

It strikes me, that some exaggeration has been made respecting the evil effects of drugs on the human body, when they have failed for the purpose intended; and that much of the evil has

been attributed to them, which belonged, in reality, to other causes. It remains indisputable, however, that much injury has been caused to many patients, by the long use of violent medicines.

The Water Cure, in the hands of the educated and skilful physician, is a safe, and most efficient means of treatment. It becomes the most powerful aid to the *self rectifying power of nature*, and by the identical means she uses in less degree, for the preservation of health: let my reader remember, that neither physis nor the physician, nor any other agent than this *power of nature*, ever really cures, or heals: that our great and chief object should be, to prevent any interference with it, and to aid its operation. Mature reflection on this point, will prepare his mind for a correct estimate of drug medication; and how far it may be practised with reasonable purpose. No doubt, the skilful practitioner may avail himself of the aid of medicines, to useful purposes, in cases of disease: many valuable lives have I seen rescued from impending death, through their judicious use.

I really can find neither sense nor truth in the extraordinary records, so often appealed to and published, of the final testimony of certain eminent physicians, respecting the injury that has been inflicted, *as a rule*, on mankind, by the use of drugs in the hands of medical men. That recorded as the declaration of the late Dr. James Johnstone, is false in itself,—declaring, in his last days, that more of harm than of benefit had been the result of drug practice, with all its connections, in the world. This is an absurd libel on a class of men—the medical profession—who, with all their faults and failings as human beings, will well bear comparison, as to usefulness, with any other of society. And the declarations, also, of other celebrated physicians, on the same subject, must be taken in a very limited, and modified meaning;—or, they are false.

The advocates and practitioners of the Water Cure may challenge all examination of its doctrines, and practice; and may defy its opponents to refute them: but scurrilous names and epithets have been, hitherto, the principal weapons of attack. It is gradually emerging, however, from the wonted ordeal of truth, when in antagonism with long established error of society, and the cherished interest of party; and it is, no doubt, destined to be a permanent blessing to the world.

It is my firm belief, that the amount of benefit to be derived from it, and its establishments, has to be rightly estimated, only in future times. The present advocates, even, have not hitherto appreciated the capabilities of these institutions, as they might be, and will be conducted; for, I can conceive in them an instrumentality for the highest purposes of earthly advantage, of a mental and moral, as well as, of a physical nature. Intimate are the connection, sympathy, and dependance, of these three conditions of man: and hence, the paramount importance of a sound state of bodily health and vigor; and great is its bearing on the mental and moral wellbeing of every individual. At a perfectly conducted Hydropathic Establishment may be best secured the most wholesome discipline; and *there* may be most easily acquired the most proper habits of diet, and general regimen, on which the various circumstances of life depend, far beyond all usual calculation.

I have already stated the chief object of this small treatise—to convey to the minds of non-medical readers, and especially to water patients, a correct knowledge of the essential principles of Hydropathy, and of the operation of its different appliances. It is evident that the attempt would be to much less purpose towards the reader entirely destitute of all knowledge of Anatomy and Physiology: I have, therefore, attempted to communicate such

knowledge of these sciences, as I deem sufficient, as the needful preparation for a proper understanding of the Water Cure. As a preliminary part, I have given anatomical and physiological descriptions, with the necessary plates of organs more immediately connected with the subject. The greater part of these are wood engravings, and they are correct representations from Dr. Southwood Smith's excellent work "The Philosophy of Health."

It is a fundamental doctrine, ever acted on by intelligent hydropathic physicians, that all chronic diseases have their original cause in the diseased, or impaired functions of the digestive, and blood-making organs: and that these, and indeed all the functions of the body, are performed through the instrumentality of nerves, is acknowledged by all. For any adequate understanding of our subject, it becomes evident, that my reader must possess some knowledge of these organs, and their functions, and nerves. Yet, I have not deemed it necessary to give a minute description of them, but a clear and concise one; which, with due attention, will enable him, with much mental gratification, and to a full extent, to comprehend the true nature of the great Water Cure. The Anatomy and Physiology of the human body are fraught with beauty and interest; and to a right mind, they will be incentive to reflection of exalted kind; and to mental exercise of very beneficial influence. Well do I remember, how the great soul of Thos. Chalmers was wont to rise in praise of the wisdom and goodness of the adorable Creator; when, in his lectures on infidelity, he spoke on these sciences. No wonder, either, that Israel's inspired poet and king exclaimed, "I will praise Thee; for I am fearfully and wonderfully made: marvellous are Thy works: and that my soul knoweth right well."

Ever keeping in view the strictly elementary character of this brief work, I have only introduced such parts of Pathology, (from

παθος a disease, and λογος a discourse) or, the account of diseases, as I have deemed necessary for illustrating the principal subject. But I have purposely taken every proper occasion for alluding to the important doctrines and facts of Physiology, (from φυσικη nature, and λογος a discourse) or, the account of the functions, nature, and uses, of the organs of the body. This has also been frequently necessary, in illustration of the principal subject: besides this, however, its own intrinsic value, and connection with daily life, make it ever interesting and useful.

I have thought it best adapted for the instruction of the non-professional reader, that the principal subject be kept, as much as can be, before his mind throughout the treatise; and I have, therefore, not confined it exclusively to one part. This, I hope, will answer the purpose of impressing it more deeply on the mind, by useful repetition, without tedious sameness: for, in every instance of the recurrence of the particular topic, it will be found in some variety of connection; and often, with additional illustration of its nature. This struck me as a likely means to succeed with those totally unaccustomed to medical subjects; and calculated, also, to render the volume, to such readers, more intelligible and more interesting; and to secure its more continuous, and more profitable perusal. My great difficulty has been, on a subject so extensive, and so replete with interesting materials, to keep down the size of the book; and brief and imperfect as it is, it has been extended beyond the limits which I marked out for myself, at the commencement of my undertaking. In composing what is herein offered in publication, I have constantly and necessarily come in mental contact with subjects in connection, which are scarcely less needful to be known; and of some of these, I fear that some readers will look for further instruction, where I have been unwillingly silent:—because, a

more minute prosecution of the work would necessarily alter its fixed character. I must reserve the remaining subjects in connection, for a future occasion, D. V.

Of the different topics unnoticed in this volume, I must make brief allusion to the particular one, which has been so much before my mind.—The different writers on Hydropathy have usually and properly noticed the very essential point of the *suitableness of locality* for Hydropathic Establishments. It is impossible to over-rate its importance; and this may be considered as the chief circumstance which so well adapts the Water Cure for the treatment of chronic diseases; and which gives it such power against them. The chief, and indeed, the indispensable requisites of any locality, for the successful practice of Hydropathy, are to be found in one which is mountainous, with pure air, and abundance of pure water. It should, also, be at a distance from all towns: and it becomes highly requisite, for the important purposes of mental, as well as for physical effect and influence, that it be suitable as to *aspect*, which ought to be *southern* or *western*; and of weighty consideration becomes the point of *scenery*, with the other collaterals, which combine to render the place *romantic* and *attractive*. The different sites on which Hydropathic Establishments are erected, have been selected in order to secure as many as possible of these advantages. Of all that I have seen or known of this important matter, there is no locality yet chosen, which is equal, in every respect, to what could be at once decided on in this immediate neighbourhood of the Hambleton Hills, abounding in every variety of romantic scenery, and having, also, abundance of the purest water; with the purest and most invigorating air, for which alone, I have known invalids resort to it with the best results; and withal, there is a perfect command of the *southern* and *western aspects*, to any extent; having in a

word, *every requisite advantage* for the practice of this effective system of treatment:—and in a range of mountains and plains, for 30 or 40 miles. There is the best ground for assurance of the greatest benefit and success, in a combination of spirited and philanthropic individuals, to build an institution of this kind,—as was done at Benrhydding; and is, at this time, being again done, in that neighbourhood. It would, doubtless, prove a blessing to thousands, in the matter of health, and the rescue from disease. And it would, as certainly prove greatly remunerative to its projectors, although conducted on a plan of lower pecuniary charges than those of other places: in addition to this, there would be the higher and nobler consideration of having contributed to the advancement of true therapeutic science, for the benefit of the afflicted of mankind.

J. H.

KILBURN, YORK,
September, 1855.

LIST OF ENGRAVINGS.

<i>Fig.</i>		<i>Page.</i>
I.	The Regions of the Body	5
II.	The Organs in their connection.....	11
III.	View of the Organic Nerves of the Stomach.....	12
IV.	The Organs in their connection.....	11
V.	View of the course of the Thoracic Duct, from its origin to its termination.....	24
VI.	View of the heart with its several chambers exposed and the great vessels in connection with them.....	40
VII.	View of the Stomach with its Muscular Coats displayed.....	42
VIII.	View of the heart on the right side.....	43
IX.	View of the heart on the left side.....	43
X.	Fomenting Machine.....	112

CONTENTS.

PART I.

CHAPTER I.

INTRODUCTORY REMARKS.

	Page.
On the primary and secondary organs of blood-making and nutrition—The change of tissue—Its means and connexions—The two systems of nerves—The two systems of blood-vessels—The principal regions of the body—Some knowledge of the organs necessary for understanding the Water treatment of their diseases.	1

CHAPTER II.

THE TEETH AND THE SALIVARY GLANDS.

The importance of perfect mastication and insalivation of food for its digestion—The teeth of different kinds—Their diseases from constitutional causes—The mucous glands—Tartar of the teeth—The salivary glands—mental influence on the secretion of saliva.	6
---	---

CHAPTER III.

THE STOMACH.

Herein takes place the first real change in the food, which becomes <i>chyme</i> —The gastric juice—Further change in the duodenum—Shape of the stomach, and position—Its connections, and its orifices—Its texture, and its motion—Its membranes, and secretions—Its blood-vessels, and nerves—Sympathy between the mind and the stomach, and its connections with other parts of the body, through both systems of nerves.....	10
--	----

CHAPTER IV.

THE SMALL INTESTINES, THE DUODENUM, THE JEJUNUM,
AND THE ILIUM.

Page.

The function of the duodenum resembles that of the stomach—Its secretion—Its contents should retain the name of *chyme*, and not, as is usual, be changed to *chyle*—The etymology of the two terms—*chyle* contained and elaborated by the lacteals—The *valvulae conniventes*—The bile, and the pancreatic juice, and that of the duodenum, commingle in its cavity—The various properties of bile—*Duodenitis* and its symptoms, and effects—The effect of the antibilious drugs given for the liver—The shrill cough of *duodenitis*—The Water treatment the most rational..... 14

CHAPTER V.

THE LIVER, THE PANCREAS, AND THE SPLEEN.

The position of the liver—Its lobes—Its size larger than that of any other gland of the body—Its function—Its important connection—The gall bladder—The ducts—Gall stones, and the great agony from their detention—The liver an organ of elimination of carbon and hydrogen—The wise arrangement of the mutual relation of the liver and lungs—The position of the pancreas—Its connection—Its juice aids chymification—The position of the spleen—Its structure and supposed use—It has been removed without injury to the individual; and in dogs..... 18

CHAPTER VI.

THE LACTEALS, THE MESENTERY, AND THE THORACIC DUCT.

The lacteal absorbents arise from the inner surface of the small intestines—The *valvulae conniventes*, and the *villi*—The course of the lacteals—The mesentery formed of the peritoneum—The contents of the duplicature—Its use—The mesenteric glands—The receptacle of the chyle—The thoracic duct—Its course and termination. 22

CHAPTER VII.

THE LARGE INTESTINES AND THE KIDNEYS.

	Page.
The office of the large intestines—The Cæcum, and its structure—Its lining membrane, and its secretion—The valve, and its office—The Colon, and its office for the secretion of fecal fluid—The cause of constipation—The different portions of the Colon—The rectum, and its sphincter—Its lining membrane—Recapitulation of the process of digestion—Its progressive stages—The lymph of the Thoracic Duct—Its nature and use—The Kidneys, organs of excretion—Their office auxiliary to that of the lungs and of the skin—They eliminate azotized matters—Their situation—Their duct the <i>ureter</i> —Its length, and diameter—Further recapitulation of the process and nature of digestion—Digestive transformation—Chylification—Vitalization, and <i>Electricity</i> concerned in it.	25

CHAPTER VIII.

THE LUNGS.

The lungs are the arena of important changes—These are necessary for the nutrition of the body—The <i>change of tissue</i> —Proofs of Divine wisdom and power—Nutrition subserved by the previous processes—The cause of all diseases is in unhealthy nutrition—The Larynx or air tube—The Trachea and the Bronchial tubes and air cells—The structure of the lungs—Their situation and lobes—The <i>rete mirabile</i> of the air cells—The Oxygen of the Atmospheric air and its agency in the air cells, and in all parts of the body— <i>Calorification</i> or generation of animal heat—Its principal cause in the <i>change of tissue</i> —Its regulation by exhalation—In much less degree from that of the lungs than from that of the skin.	32
--	----

CHAPTER IX.

THE HEART AND ARTERIES.

The position of the heart—The pericardium and its secretion—The two halves of the heart—Its auricles and ventricles	
---	--

—Their structure and different uses—The pulmonic circle of circulation—The systemic circle of circulation—The double circle of circulation—The valves, and their wise adaptation—The quantity of blood, and other interesting particulars of the circulation—The *systole* and the *diastole* of the heart—The great object accomplished by the capillary circulation of arterial blood, with that of the veins—The *change of tissue* and the *generation of animal heat*—Liebig's account of these two great functions—Recapitulation of their production and effects—Remarkably verified in the Water Cure—The Winter best for Water treatment. 38

CHAPTER X.

THE SKIN.

The best medium of remedial operations—Allopathic practitioners have neglected it—Surprising that they have not thought more of the skin—The offices of the skin—Its structure—The *dermis*—The *rete mucosum*—The cuticle or scarf skin—The vascular plexus—The nerves of the skin—Its absorbents—The sebaceous follicles, and the scent—The hair, and its bulbs—The nails—The sense of touch—The perspiration, sensible and insensible—The skin and the internal mucous membrane but a continuation of each other—a great fact of physiology, and ever regarded in the Water Cure' 50

CHAPTER XI.

THE ELIMINATING FUNCTIONS OF THE SKIN, THE LIVER, AND THE LUNGS.

These are the three emunctories of carbon and hydrogen—They become vicarious and compensative in their functions—The liver becomes supplementary to the lungs and skin—In disease of the lungs, the increased action of the liver—Tropical climates afford illustration—And the summer season of our own country—The wrong habits of Englishmen in India—The consequences—Quotation from Wilson—The Water treatment in these cases of overwrought organs—The same fault of dietetic habits in England as in tropical climates—The account current—

CONTENTS.

xxiii
Page.

The Water Cure effectual—Unreasonable conduct of many patients—The apology for them—Hope regarding the utility of this treatise—Want of other kind of arrangement of Hydropathic Establishments.....	56
--	----

CHAPTER XII.

GENERAL OBSERVATIONS ON THE ORGANIC AND ANIMAL FUNCTIONS, AND THEIR CONNECTION WITH DISEASE, AND THE WATER CURE.

Two distinct kinds of functions, organic and animal—ganglionic nervous centres—The distinguishing characteristics of each kind of nerves—The organic nerves also require due nutrition—Various kinds of disease from their derangement—Cancer, atrophy, and hypertrophy—The animal centres and their nerves dependant on them—The brain and spinal cord, the source of animal life, and of sensation, and the mental faculties—The excito-motory system of nerves—Spinal cord for locomotion and volition—The wise adaptation of the two kinds of functions—Sympathy between them—Organic irritability—The onset of disease—The change of tissue of the brain—The cause of insanity—Nervous complaints—The concern of mothers, and of literary men—Plato, and his disciples—All diseases from disorder of organic centres—Gout and Rheumatism—Erysipelas—Neuralgia—Exanthematous diseases—Hæmorrhoids—Consumption.....	63
--	----

PART II.

CHAPTER I.

GENERAL OBSERVATIONS ON THE NATURE OF THE WATER CURE, AND ITS MODE OF ACTION.

Hippocrates and other authors have held the doctrine of the *power of nature* in the cure of disease—In water treatment, the great point in view—This *organic power* not correctly apprehended—Its definition—The means and appliances of the Water Cure for the *change of tissue*—The mode of its performance—The negative means of treatment—Effects of alcohol—Use of drugs in the water

treatment—Treatment out of establishments—Mental influence of a physician's care—The Water Cure is nature's way—Homœopathy and mesmerism—Opponents—Action of means—All diseased action from morbid state of nutritive nerves—Broussais and Andral—Different conditions from the state of the nutritive nerves—The blood in capillary vessels—State of digestive organs, and its influence—From nervous deposit, various changes—Quotation from Gully—The skin the best medium—The duty of the physician—The patient warned—Operation of means on the animal system—Crisis—The Colon, and its office—Maldistribution of blood—Deficiency of it, and Gully's remarks—Chemical agency of the Water Cure—Liebig's account—Principal objects of water treatment	84
--	----

CHAPTER II.

THE PROCESSES OF THE WATER CURE, AND THEIR ACTION ON THE HUMAN BODY.

Quotation from Wilson—Recapitulation of important points—Knowledge of physiology and pathology necessary for successful practice, as remarked by Gully—The author's experience.....	107
FOMENTATION	111
WET SHEET PACKING	117
THE COMPRESSES	132
THE SWEATING PROCESSES	139
THE WET RUBBING SHEET	150
THE SITZ BATH	153
THE SHALLOW BATH.....	157
THE DOUCHE BATH	162
THE SHOWER BATH AND RAIN BATH	167
THE HAND AND THE FOOT BATH	169
THE PLUNGE BATH	174
SPINAL WASHING	182
THE HEAD BATH, AND EYE BATH, AND MINOR ABLUTIONS	185

CHAPTER III.

THE AUXILIARY MEANS OF THE WATER CURE.

WATER DRINKING	187
DIET	195
LIGHT	211
AIR AND EXERCISE	215
CLOTHING	221

THE WATER CURE.

PART I.

On the Anatomy and Physiology of the Organs of Digestion and Nutrition.

CHAPTER I.

INTRODUCTORY REMARKS.

On the primary and secondary organs of blood-making and nutrition—The change of tissue—Its means and connexions—The two systems of nerves—The two systems of blood-vessels—The principal regions of the body—Some knowledge of the organs necessary for understanding the water treatment of their diseases.

In the following description will be specified the more important particulars of Anatomy and Physiology, which are most necessary to be known by the non-medical reader; and such observations will be added, as the occasion may suggest, and such as may tend more strongly to fix on his mind, the knowledge of the structure and function of the organ under consideration. The stomach, the liver, the pancreas, and the small intestines, will be described with sufficient minuteness:

these are the upper organs of digestion, or *the primary organs* of blood-making. The heart and lungs are the *secondary organs* of blood-making; their function of respiration being the secondary and completing process, for the formation of perfect, arterial, and vitalized blood, now of suitable quality for its circulation, by the heart and arteries, to every part of the body; and from which is supplied the necessary material for its constant reparation; to supply the waste of the various tissues, constantly going on. In the great chemico vital process, *the change of tissue*, which is subserved by the functions of digestion, respiration, and the circulation of the blood. Healthy blood is formed from the food; by the heart and arteries it is circulated through the whole frame; and by the extreme or capillary branches of these arteries is the necessary material supplied, according to the nature of the tissue to be renewed. By the extreme or capillary branches of veins, is the effete and wasted matter removed, and carried back to the lungs, for depuration, by contact with the atmospheric air. My reader must remember, that this, like every other function of the body, is effected through the primary agency of nerves: of these we shall say more in explanation, anon. Its being properly accomplished, constitutes the condition of health. Its many kinds of derangement become as many causes of disease. It may be easily conceived, that the more rapidly and perfectly it is performed, the more healthy and perfect will be the material structure of the body, and of all its parts; and necessarily, the more perfect will be the performance of their functions. We may state in anticipation, that this rapidity and perfection of *change of tissue* are especially favoured by

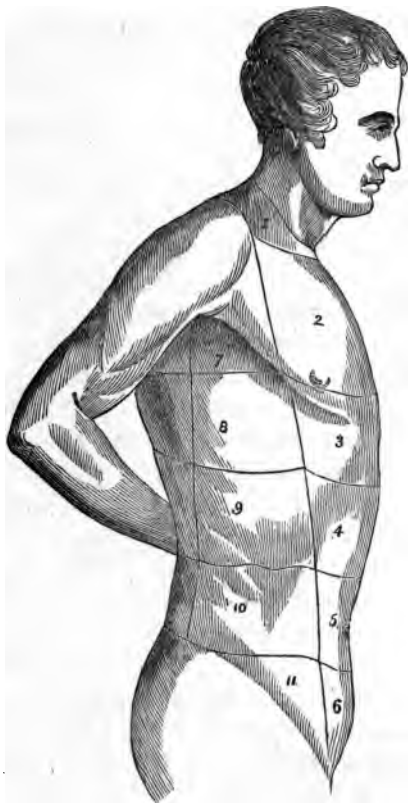
Hydropathic treatment. Hence the chief ground of its excellence, as a remedy. We have mentioned the agency of the nerves, by which every function of the body is performed. They are the instruments of all vital action. To facilitate the correct understanding of what has to follow, we must here make some brief and general statements respecting them.

In the human body there are two distinct kinds of nerves, which serve for distinct purposes of *animal*, and *organic life*. The former, or *animal system of nerves*, are for sensation, and the mental functions of the brain, and for volition, and locomotion: these rise from their great centres, the brain, and spinal cord; and are distributed to every part of the body. The second, or *organic system of nerves*, are insentient, or without any sensation, or feeling, in their healthy state. They are also called the *ganglionic nerves*, because of knots, (*γαγγλια*) which are found, of various sizes, in their course, and are of largest size, and of greatest number, around the central organs of the body; and are called the *ganglionic centres*. These nerves are also denominated the *nutritive nerves*, because of their serving the great purpose of nutrition. They are also termed the *visceral nerves*, because they have their centre in the *viscera*, and supply them with power for their functions. They are not at all subject to the will, neither are they cognizant of pain; yet they hold the most important position in the animal economy. They are chiefly concerned in the causation of its diseases, as well as in all remedial operations for their cure. Through their agency is performed every process of the body, excepting those of sensation, and the cerebral functions,

and those of voluntary motion, as already stated. They pervade every structure and part of the body ; every organ, and every vessel, and by them are their nutrition and integrity secured. Nevertheless, all important as are their nature, their extent, and their operations, they have not, hitherto, had that attention given to them, which is so imperatively requisite in the investigation of disease, and in the selection of remedial measures for its cure. It is on the correct physiological doctrines in relation to the two systems of nerves, that chiefly rests the philosophic water cure. And doubtless, every other system of cure, which is not in relation to them, must be erroneous. We leave the subject for the present.

We have further to state in anticipation, and for the non-professional reader's better understanding of the succeeding description, that there are two distinct systems of blood-vessels in the human body : firstly, the *arterial system*, of which the vessels called *arteries*, receive the vitalized blood from the left side of the heart, by their great original trunk, called the *aorta*. This rises from the left ventricle of the heart. It afterwards divides into branches ; and these, again into others, continually of smaller caliber, as they proceed to the ultimate tissues of the body, until they become *capillary or hair like arteries* : by these is conveyed, to every tissue, the needful nutritive material for the supply of the great chemico vital process, the *change of tissue*. Besides this, and indeed, in this, they are concerned in the generation of *animal heat* ; and in the various secretions, which will be treated of in due order. The motion of the blood in the arteries, first given by the strong impulse of the heart, causes the *pulse* in them, by which the medical practitioner

FIG. I.—*The Regions of the Body.*



1. The Humeral Region. 2. The Subclavian. 3. The Mammary. 4. The Epigastric. 5. The Umbilical. 6. The Hypogastric. 7. The Axillary. 8. The Subaxillary or Lateral. 9. The Hypochondriac. 10. The Iliac. 11. The Inguinal.

judges of the state of the heart and circulation. The name of artery (*αρτήρεια*) was given previously to the discovery of the circulation by Harvey. They were supposed to contain air, or animal spirits; because of their being found always empty after death.

The other system of blood-vessels are called *veins*, and are of different, and less powerful structure, in their coats, than the arteries. They have no pulsation; and differently to the manner of the arteries, they commence in their extreme, or capillary branches, and unite, and gradually enlarge in their caliber, whilst returning the carbonized blood, with the *debris* of the *change of tissue*, from all parts of the body to its centre, the right side of the heart, to be sent by this again to the lungs for depuration, in its exposure to the atmospheric air. Thus the reader perceives, that the arteries carry the blood from the left side of the heart, to the extreme parts of the body; whilst the veins return it from those parts, to the right side of the heart. The course of their contained blood is, necessarily, in a contrary direction: that of the arteries, is from the centre to the circumference; that of the veins, from the circumference or extreme parts, to the centre, the heart.

For convenience of description, in matters connected with the Anatomy, and Physiology, and Pathology of the human body, it is divided by anatomists into different regions, to each of which is given a name, according to its situation. This is a very useful arrangement, and a knowledge of it will greatly aid my reader to more readily understand the relative position of the organs of the body. That knowledge will be easily attained, and for the purpose, he will see *Fig. 1*, of the principal regions of

the human body, and such as are connected with our subject.

We now proceed in further preparatory description of the chief organs, more immediately concerned in providing for the ever changing structures of the body. The reader, the Water Patient, is reminded, that I select that part of the anatomy and physiology of the human frame, which he ought to understand, in order to attain a competent knowledge of the Water Cure; to appreciate its efficacy and value, as a remedy; to inspire him with rational confidence, whilst under it: that there will ever be the cheering prospect of success, in the restoration of his health; he being a determined co-operator in the aims and measures of his physician. His own deficiency of resolution to obey the rules of treatment; his own fault, and not that of the scientific Water Cure, will cause disappointment; as in instances I have occasionally witnessed.

CHAPTER II.

THE TEETH AND THE SALIVARY GLANDS.

The importance of perfect mastication and insalivation of food for its digestion—The teeth of different kinds—Their diseases from constitutional causes—The mucous glands—Tartar of the teeth—The salivary glands—mental influences on the secretion of saliva.

Before the food enters the stomach, it has undergone mastication and insalivation in the mouth. These constitute the primary, and very necessary, alteration to be wrought on it. For this purpose, a perfect

set of teeth is a valuable requisite; and great is the hindrance to digestion sometimes caused by the want of them, because of the consequent imperfect mastication. Some individuals, in possession of good teeth, are known to suffer because of hasty eating, and being careless to masticate properly. Often have I had to give strict warning to the dyspeptic on this subject; so frequently have I known the patient's disregard of it to be the cause of indigestion, with attendant pain and flatulence.

A perfect set of human teeth is formed of sixteen in each jaw. There are eight of similar kind on each side of each jaw. They are divided by anatomists into four classes. Two incisors, or cutting teeth, in front: next to these, is one cuspid or pointed tooth; then, two bicuspids, or double pointed; then, three molars, or grinders. The incisors have only one fang, or root, and of regular and round shape. The cuspids and bicuspids have severally, but one fang; but the former have this flattened, and partially grooved; the latter have their fang more flattened, and sometimes, also, divided at the extremity, and appear, as if two fangs had been united. The molar teeth have sometimes two, sometimes three, sometimes as many as four fangs, and especially the centre ones.

The teeth are ever in intimate relation to the nature of the food and habits of the animal possessing them. The anatomist can discover, by his examination of them, what is the precise structure, and extent of its digestive apparatus; also, of its nervous system; and, even of its physical and mental characteristics. To the teeth are supplied blood-vessels, and nerves; and, they thereby become an integrant and sympathizing part of

the living body. The diseases of the teeth, with their decay, are ever the consequences of constitutional causes ; although the direct application of noxious substances will act on them chemically, and cause their destruction. Their diseases, as those of other parts, have their origin in the morbid state of the organs of nutrition. Hence it is, that those of rustic habits of life possess such perfect, and beautiful teeth ; whilst the gourmandizing and indoor inhabitants of cities and towns are often afflicted with the opposite kind. The state of the stomach has a special connexion with that of the teeth ; and thus it is, that the best remedies for toothache, are those which operate on that organ.

Whilst the food is undergoing mastication, it is more minutely divided, and rendered more fit for its further change in the stomach, by imbibing certain fluids in the mouth. These fluids are secreted, or separated, from its lining membrane by very numerous glands, which are placed on the gums, the lips, the cheeks, and palate, and on the tongue : this is mucus, and the like fluid lubricates, also, all the open cavities of the body. What is usually termed the *Tartar of the teeth*, is produced by this mucus, and is firstly precipitated on the enamel. It soon undergoes chemical decomposition ; and becomes yellow, through the influence of the atmospheric air. The further decomposition is favored by the warmth and moisture of the mouth ; and earthy phosphates are formed by oxidation, and are deposited on the teeth. This *tartar* may be therefore considered, as the *ash* of the mucus, as a crystallized deposite.

The largest quantity of fluid in the mouth is the *saliva*, or *spittle*, which is formed, by six salivary glands.

The name of *saliva* is given, because of its *saline* nature ; although this is imperceptible under ordinary circumstances, we are made aware of it in disordered conditions of the stomach ; when its saline quality is either increased, or more easily perceived. The largest of the salivary glands is the *parotid gland*, situated before the ear : again, there is the *submaxillary gland*, situated under the lower jaw ; and the *sublingual gland*, situated under the tongue. There are three on each side ; and every one has a duct, by which the saliva they severally secrete, is conveyed into the mouth. It is there mixed with the mucous fluid from the innumerable small glands just mentioned ; and this mixture is usually denominated the *saliva*. During fasting hours, it is continually formed, and passes down into the stomach, by successive acts of deglutition or swallowing. Thus it is, that a considerable quantity of it is usually contained by it. The influence of fear, and of mental anxiety, over the secretion of saliva, has been long known in the world ; and it is in the curious fact of their operation, in suspending it, that the ordeal of suspected criminals among the Hindus, was, no doubt, established. Such persons, under accusation of crime, were made to chew dried rice, in the presence of the judge. Those who could not at once return it, in a soft and pulpy form, were supposed to be guilty—their conscience being taken for the jury.

CHAPTER III.

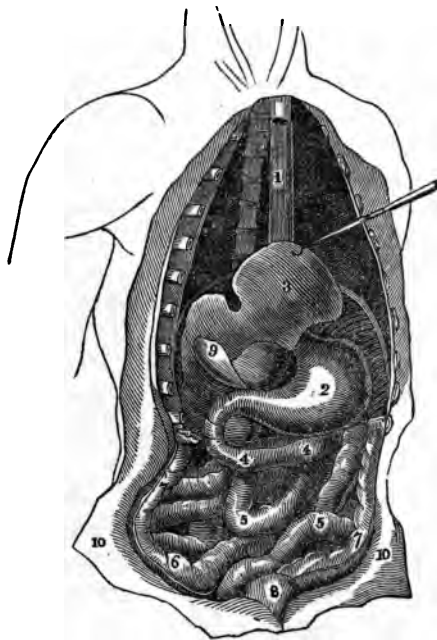
THE STOMACH.

Herein takes place the first real change in the food, which becomes *chyme*—The gastric juice—Further change in the duodenum

—Shape of the stomach, and its capacity, and position—Its connections, and its orifices—Its texture, and its motion—Its membranes, and secretions—Its blood-vessels and nerves—Sympathy between the mind and the stomach, and its connections with other parts of the body, through both systems of nerves.

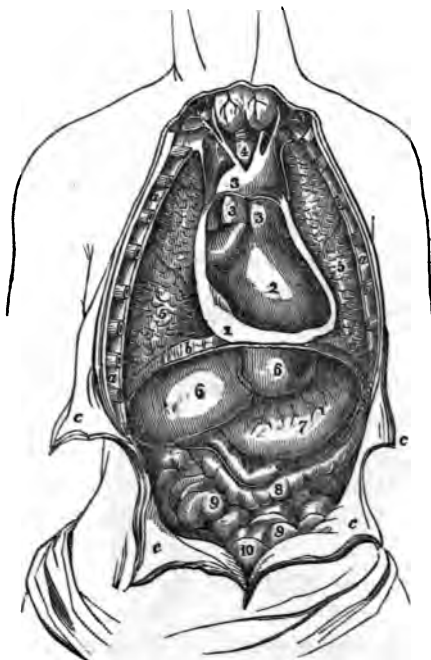
At the times of taking food, the saliva flows in much larger quantity of six, or eight ounces at each meal, for the purpose of softening, and partially dissolving, the masticated mass, and in preparation for the further and subsequent changes it has to undergo in the stomach. In its masticated and insalivated state, it now passes, by the act of deglutition, through the *Esophagus*, or *gullet*, into the stomach. Here takes place the first real change in the food by the process of digestion. Here it first changes its character, and its name, and becomes *chyme*. There have been different opinions respecting the nature, and the mode of this change : no doubt exists as to the principal agency of the *gastric juice*, in effecting it. This is the well-known fluid, which is secreted by the minute vessels of the internal lining of the stomach. It contains free muriatic acid. The illustrious Liebig ascribes its chief power to the gradual decomposition of a matter dissolved from the lining membrane, aided by the oxygen in the saliva. It is supplied, in suitable quantity, at the time it is needed, for chymification. This process is the decomposition and recomposition of the food into a homogeneous, pultaceous mass, to be then transferred to the *Duodenum*, the first of the small intestines ; sometimes called the *second stomach*. In this it undergoes further progressive change in chymification ; and it is brought under the influence of the *bile*, delivered by a duct from

FIG. II.—*The Organs in their connection.*



1. Esophagus. 2. Stomach. 3. Liver raised, showing the under surface. 4. Duodenum. 5. Small intestines, consisting of—6. Jejunum and Ilium. 7. Colon. 8. Urinary bladder. 9. Gall bladder. 10. Abdominal muscles divided and reflected.

FIG. IV.—*The Organs in their connection.*

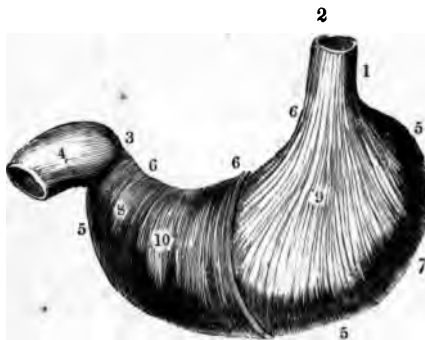


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| <p>a. The cut edges of the ribs, forming the lateral boundaries of the cavity of the thorax.</p> <p>b. The diaphragm, forming the inferior boundary of the thorax, and the division between the thorax and the abdomen.</p> <p>c. The cut edges of the abdominal muscles, turned aside, exposing the general cavity of the abdomen.</p> | <p>1. The cut edge of the pericardium turned aside.</p> <p>2. The heart.</p> <p>3. The great vessels in immediate connexion with the heart.</p> <p>4. The trachea, or wind-pipe.</p> <p>5. The lungs.</p> <p>6. The liver.</p> <p>7. The stomach.</p> <p>8. The large intestine.</p> <p>9. The small intestines.</p> <p>10. The urinary bladder.</p> |
|---|--|

the liver ; also, under that of the *pancreatic juice*, from the pancreas. These two organs do each convey, by a duct, their respective secretions into the duodenum ; more of them anon. At present, we must say more on the anatomy of this chief organ, the stomach, which usually occupies so large a share of the attention of mankind. It is seen in its connexions in *Fig. 2*. It is a bag of irregular shape ; and of capacity, in an adult male, to contain about three pints of fluid. In the female, it is generally less. It occupies a transverse position across the upper part of the abdomen. It entirely occupies the *epigastric region*, which has its name because of this (ἐπὶ γαστρὸν.) It also, occupies a large share of the *hypochondriac region*. It is in contact with the Diaphragm, or midriff, above ; and with the small intestines, below ; with the liver, on the right ; and with the spleen, on the left. The esophagus, or gullet, opens into the upper and larger extremity, on the left side, by what is called, the *cardiac orifice*. The smaller extremity is on the right side ; and in it, is the *pyloric orifice*, so called ; because of a strong circular muscle, surrounding it, whose office is, to retain the contents of the stomach for a proper time ; also, to prevent the further progress of any unsuitable matter within it : hence its office of porter, or guard, (πυλωρός). Its mode of action is not as a *valve*, as many anatomists have erroneously stated, but as a *sphincter muscle*. It opens into the duodenum. We must mention what is most useful to be known of the structure of the stomach. It is constructed of two coats, or layers of muscular fibres ; the external one is in a longitudinal, the internal, in a circular direction :

by the contraction of the former, it is shortened in its longitudinal, and, by that of the latter, in its circular extent. Thus, whilst digestion is proceeding, a necessary degree of vermicular motion is given to its contents, by which they are more exposed to the influence of the gastric juice. There is an external coat or covering, from the membrane covering all the abdominal viscera, and lining the abdomen itself, the *peritoneum* (*περι τειννω*); also an internal one, the *mucous membrane*, which is a continuation of that which lines the mouth, and covers the tongue. Because of this anatomical connection, medical men usually inspect its condition and appearance, as presented on the tongue, as an index of its condition in the stomach, and bowels. The function of digestion being of such vital import to the well-being of the animal economy, we find that an abundant supply of blood is ever sent to the stomach; and the liver, pancreas, and spleen, are supplied with arteries from the same common trunk; and there is the freest communication between them. In great abundance is the supply of nerves; and this fact we notice more especially, that the reader may familiarize his mind with the important connection of this great nervous supply, and with the relation and sympathy held by the stomach, in its function of digestion, with so many other functions, and operations, physical, mental, and moral, of the individual. It has abundant supply from both systems of nerves: from the organic, or ganglionic, and non-sentient: also from the animal nerves, those of sensation, and of the cerebral functions. By *Fig. 3*, he will perceive that the organic nerves form a net work appearance on the centre of the stomach. They accompany the arteries in all the ram-

FIG. VII.—*View of the Stomach with its Muscular Coats displayed.*



1. The esophagus terminating in the stomach. 2. The cardiac orifice. 3. The pylorus. 4. The commencement of the duodenum. 5. The large curvature of the stomach. 6. The small curvature. 7. The large extremity. 8. The small extremity. 9. The longitudinal muscular fibres. 10. The circular muscular fibres.



FIG. III.—*View of the Organic Nerves of the Stomach.*



1. Under surface of the liver turned up, to bring into view the anterior surface of the stomach.
2. Gall bladder.
3. Organic nerves enveloping the trunks of the blood-vessels.
4. Pyloric extremity of the stomach and commencement of the duodenum.
5. Contracted portion of the pylorus.
6. Situation of the hour-glass contraction of the stomach, here imperfectly represented.
7. Omentum.

ifications of their most minute and capillary branches. By these innumerable organic nerves, the stomach is enabled to perform its part of digestion, in the process of blood-making, and when duly performed, and in health, it is always without the knowledge of the individual, and independently of the will. Again, because of the supply of nerves, also, of the sentient or animal system, which freely communicate with those of the organic, the function of digestion is so far with the cognizance of the mind that it derives pleasurable feeling of buoyancy and vigour, which is that of health, when the discharge of function is correct and sound. Greatly and ostensibly different is the mental condition, when that of the organic nerves, and consequently of the stomach also, in digestion, is deranged : and deeply, and mutually, are both systems of nerves involved. Because of the circumstance here alluded to, every degree and variety of nervousness, and pain, and mental disorder, may occur. But we will again consider, and more fully demonstrate this very interesting fact of pathology, in the more advanced part of this treatise. It is well known that the influence is great, and reciprocal, between the mind and the stomach ; and it is through this nervous connection, that digestion is usually rapid and good, when the mind is happy : again, that imperfect digestion is often the effect of mental distress. This intimate sympathy is often experienced instantaneously ; and every observant person must be familiar with the circumstance.

Our matchless bard Shakespear, whose knowledge on all subjects was truly wonderful, notices this physiological fact. When Henry the eighth dismisses Wolsey from his service, and puts into his hands the papers of discharge, he says to him

Read o'er this ;
 And after this : and then to breakfast
With what appetite you have.

CHAPTER IV.

THE SMALL INTESTINES, THE DUODENUM, THE JEJUNUM, AND THE ILIUM.

The function of the duodenum resembles that of the stomach—Its secretion—Its contents should retain the name of *chyme*, and not, as is usual, be changed to *chyle*—The etymology of the two terms—*chyle* contained and elaborated by the lacteals—The *valvulæ conniventes*—The bile, and the pancreatic juice, and that of the duodenum, commingle in its cavity—The various properties of bile—*Duodenitis* and its symptoms, and effects—The effect of the antibilious drugs given for the liver—The shrill cough of *duodenitis*—The Water treatment the most rational.

Having described the stomach, and its office for the first formation of chyme from food, we proceed to notice further the change, which it undergoes in the duodenum, as already alluded to. This intestine is about twelve inches in length; and hence its name. (Duodecim). It is seen in connexion in *Fig. 2*. It is the first of the *small intestines*; but in its function, it very much resembles the stomach. Like the stomach; it secretes a peculiar, and powerfully solvent fluid from its inner tunic, which co-operates with the other two fluids, the bile, and the pancreatic juice, in effecting the further transformation of the alimentary mass, now passed through the *pyloric orifice*, into the duodenum, for the purpose of becoming *chyle*, according to the physio-

logists of the present day. But here, we think, is the misapplication of a name. These terms, *chyme*, and *chyle*, are from *χυμος* and *χυλος* and, both signify *juice*. They have been said by some modern writers to be synonymous. They are nearly so. There is, however, a shade of difference in their etymology: the former, meaning *juice* or *liquid*, produced in any manner; the latter, means *juice*, more especially *squeezed out*, or *extracted*, from anything. Thus, the application of the terms becomes strictly correct as we have used them in this treatise. The word *chyme* applying to the alimentary mass whilst it remains in the intestines; and the word *chyle* being applied only to the fluid extracted from it by the lacteals. This mass is uniform in external character and properties whilst it remains in the intestinal canal, and is only in its more perfect stages or states of *chyme* as it proceeds. The first change made in it, to alter its appearance and entire quality, so far as to entitle it to the other term of *chyle*, takes place on its removal by the lacteal absorbents; as stated also by Dr. Wilson, and this is chiefly effected from the *surface* of the *Jejunum* and *Ilium*, the other small intestines. After undergoing the requisite elaboration in the duodenum, the chymous mass is transmitted along its internal surface, by the same kind of motion by which it was propelled from the stomach; that is, in a vermicular, and irregular manner; but always progressive downwards, into the *jejunum* and *ilium*. The internal surface of these small intestines is arranged in certain folds, called *valvulae conniventes*, by which it is greatly extended; these are covered with the *villi* of velvet-like appearance, and composed of minute arteries, and veins, and nerves, and mucous ducts: there are in them also,

the *lacteal absorbents*, so called on account of the *milk-like chyle*, which they absorb, and contain, to be conveyed by them, for its commixture with the blood.

We must particularize further on this important part of our subject. The three fluids, which act on the alimentary mass in the duodenum, are, its own secretion, which is of equally solvent power as that of the gastric juice; again, the pancreatic juice, which contributes highly animalized substances; and, lastly, the bile, which answers such important purposes, that we must specify them separately. It gives to the chyme highly *azotized* or *animalized* substances, which make it, in composition, nearer that of the blood. Again, the alkali of the bile, with that of the pancreatic juice, neutralizes the acid of the chyme, and gives it alkaline properties. It also acts on the oily or fatty matters, converting them into a whitish emulsion, and more easily absorbed by the lacteals in the jejunum and ilium. The bile has further purpose to serve, in addition to that of elaboration of the chyme, and in the whole length of the intestinal canal. Of the remaining and excrementitious ingredients in its composition, a bitter resin serves, by its action on the bowels, to preserve their healthy condition. It has also an antiseptic influence on the excrementitious portion of the alimentary mass, in its passage through the larger bowels. In proof of this, we find their contents in a more putrescent state, when the usual quantity of bile has been withheld.

We must now return to take further consideration respecting these important organs. And firstly, we suspect that the *duodenum*, and its momentous office, and its diseased conditions, are not sufficiently considered, or

understood, by many practitioners. Frequently, the disorders which have been attributed to, and treated as of the stomach, have had their origin, and main seat, in this intestine. It is largely supplied with *organic nerves*, and blood-vessels; and on every consideration of its attachments, and provisions, we are led to conclude as to the importance of its functions, and the frequency of its derangements. The stomach, the duodenum and the liver, are united in closest sympathy, and they usually and mutually participate in their diseases : yet, each one becomes a starting point, and principal seat, of diseased action. The duodenum holds this position, much more frequently than is supposed by many practitioners of the present day. *Duodenitis* or inflammation of its mucous membrane, usually involves the liver, in its disorder ; giving rise to the symptoms under the common, but not very intelligible term of *biliousness*. The stomach also suffers, in its proportion, and according to circumstances. Yet, in *duodenitis* we mark, more particularly, the same kind of symptoms which denote liver disorder. We have the same sympathetic disturbance of the brain ; and pain of the right shoulder ; with other derangements. The communication between the two organs becomes direct through the bile duct. The irritation of this, at its entrance into the intestine, explains to us the mode of its operation. This, too, is the most evident explanation of the operation of *antibilious* drugs, so called, calomel, colchicum, and such like, intended to operate on the liver. They must do so, if at all, through the duodenum, and in stimulating the bile duct, opening on its surface. There are other symptoms, more especially indicative of duodenitis. Of these, we notice the nausea,

or even vomiting, which takes place two or three hours after a meal, and when it is passing downwards in contact with the inflamed mucous membrane of the intestine. A distinguishing symptom of the disease is in the great irritation of the brain, which it causes at its onset, and before the liver has become much disordered in consequence. Repeatedly have I seen this, in such degree, as to render the unfortunate invalid quite ungovernable. We discover the disease also, by the extreme tenderness on pressure over the seat of the duodenum, and below that of the stomach; and by a pain extending to the spine, at its lower part. To the experienced practitioner, the peculiarly hard, and shrill cough of *duodenitis*, is well known; and, it may be produced by the slightest pressure on the region of the affected organ. This very intractable complaint has been often treated for liver disease, as well as for that of the stomach; and much harm has resulted from the stimulating drugs, given for its cure. How different must be the prospect of remedy in the Water treatment! In the soothing applications to the exterior surface, in order to relieve interior, and irritated parts, of their surplus of blood! and in the processes, which are so powerful, to withdraw it to other and distant parts of the body!

CHAPTER V.

THE LIVER, THE PANCREAS, AND THE SPLEEN.

The position of the liver—Its lobes—Its size larger than that of any other gland of the body—Its function—Its important connections—The gall bladder—The ducts—Gall stones, and the

great agony from their detention—The liver an organ of elimination of carbon and hydrogen—The wise arrangement of the mutual relation of the liver and the lungs—The position of the pancreas—Its connection—Its juice aids chymification—The position of the spleen—Its structure and supposed use—It has been removed without injury to the individual; and in dogs.

The liver chiefly occupies the space under the ribs of the right side, the right hypochondriac region. It consists of two parts, or lobes; the left one, which is the smaller, extends transversely across the epigastric, and into the left hypochondriac region. The right lobe is four or five times larger than the left one, and extends to the lower ribs of the right side. The organ is seen in its position in *Fig. 4*, and turned up in *Fig. 2* and *3*. There is also a very small lobe, of triangular form, situated on the under surface of this largest and right one. It is called the *lobulus Spigelii*, from its describer, *Spigellius*. The liver is the largest gland of the body; and its office is to secrete the bile from venous blood, which is derived from the abdominal organs. The only arteries in the liver are for its nourishment. Its functions, and the relation it holds to the other organs of digestion, and to the whole system, make it an object of great moment, and ever demanding the attention of the Hydropathic Physician. Frequent, and various in degree, and character, are the cases of its functional derangement, and of its structural disease, which come under his care. Many of the most remarkable cures of the water treatment, have been of cases in which the function or structure of the liver has been involved; and frequently when drug medication, had been of no benefit. We see in

liver disorders, an extensive field presented to the inexperienced practitioner, who may be so regardful of symptoms as to treat effects instead of causes : for its connections and sympathies are numerous.

On the lower surface, and near the centre of the liver, is situated the *Gall Bladder*, which is a reservoir, into which bile is carried by the *cystic duct*. This is connected with another, called the *hepatic duct*, and formed by the minute biliary vessels, or canals, from all parts of the internal structure of the organ. These two unite to form the *choledoch duct*, which opens into the duodenum, as said before. In certain deranged states of the bile, there are deposited from it, *gall stones*, in the gall bladder. Sometimes, these deposits become wedged in the duct, on their way to the duodenum, whither they often ultimately arrive, and are carried down the intestinal canal. Previously to this more fortunate event, they often become the cause of intense agony ; as I have repeatedly witnessed, but more to pity than to relieve the poor sufferer by any means in my power. I have not yet seen a case of it treated hydro-pathically : however, I can believe that the soothing appliances of Water treatment give most promise of relief, and to aid the gallstone in its passage into the intestine.

The large size of the liver, and its position in the body, afford the strongest indication of the importance of its office in the animal economy. In addition to its function of supplying the bile for digestion, it holds a prominent position, as a *depurating* and *eliminating* organ ; being greatly auxiliary to that of the lungs. It is indeed, a chief eliminator of carbon, that particular substance, whose presence in venous blood, gives to it

its quality of impurity, and unfits it for sustaining life. The liver is the only organ in the body which elaborates its secretion from venous blood. It abstracts its carbon and hydrogen, in secreting bile, which consists principally of these. From the venous blood which circulates in the lungs, the carbon is abstracted to unite with the oxygen of the air inspired, and to form by this union, carbonic acid, which is evolved in every expiration. A beautiful arrangement is exhibited in the mutual co-operation of the liver, and lungs, in their physiological action of decarbonization of venous blood. Of it we shall treat more fully when we come to the subject of respiration. The Hydropathic Physician finds in the consideration of it, connected with the pathology of these organs, an argument, scarcely short of demonstration, of the scientific correctness of his system of treatment.

The pancreas is a gland of oblongated form, and is called the *sweet-bread*, in animals. It is placed transversely across the epigastrium, and behind the stomach. It is connected with the duodenum, by its right extremity, and with the spleen, by its left one. Its secretion, the *pancreatic juice*, is carried by a duct into the duodenum, to aid the bile, in the second stage of chymification.

We here notice the Spleen, which is placed in the back part of the abdomen, on the left side, and above the left kidney. It is composed of cells, and blood-vessels, and lymphatics, with areolar tissue. Its use is not yet known decidedly to physiologists. One opinion respecting it is, that it serves as a reservoir of blood, to be supplied to the stomach, when required at the times of digestion; and that the organs concerned in it, have

this means of relief under ordinary circumstances. This, however, is but an opinion for the time, until more be discovered of its function. It does not appear to be really *essential* to life; for John Hunter removed it entirely from a wounded man, who survived for many years, and did not appear to suffer from the loss of it. Besides this instance, there are others on record. Other physiologists have experimented, in their abominable cruelty, on dogs, in proof of a fact already established. Some of these have observed, that the poor animals became fatter than before the operation; others could find no difference from it.

CHAPTER VI.

THE LACTEALS, THE MESENTERY, AND THE THORACIC DUCT.

The lacteal absorbents arise from the inner surface of the small intestines—The *valvula conniventes*, and the *villi*—The course of the lacteals—The mesentery formed of the peritoneum—The contents of the duplicature—Its use—The mesenteric glands—The receptacle of the chyle—The thoracic duct—Its course and termination.

The length of the whole intestinal canal is usually reckoned six times that of the body. The length of the small intestines four times, making it double that of the large ones. The small ones consist of the *Duodenum*, the *Jejunum*, and *Ilium*. The large ones are the *Cacum*, the *Colon* and the *Rectum*. Let us take further consideration respecting the *Lacteal Vessels*, which rise from the surface of the small intestines, and after

it, we will give a brief account of the large bowels.

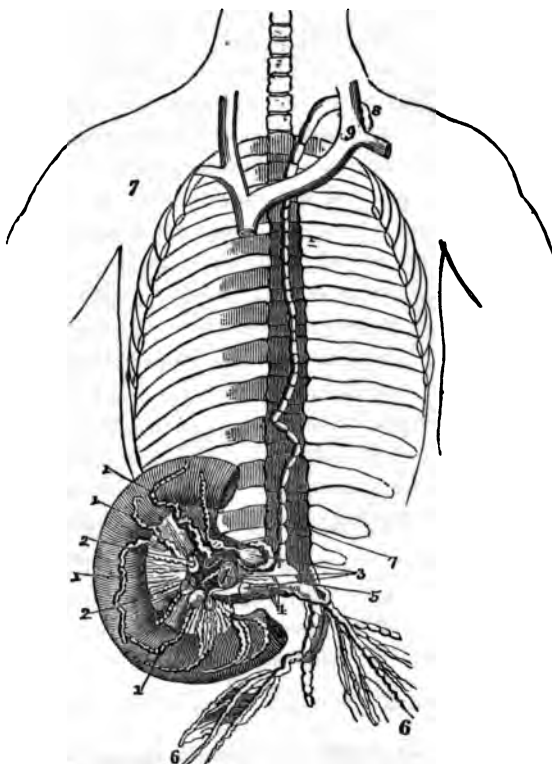
The mucous coat of the small intestines is greatly enlarged in extent, by being disposed in folds, which are called in technical language, *valvulae conniventes*. These folds are broadest at their fixed extremities, and narrow at the other, which is loose. This simple arrangement secures a still larger surface for the distribution of the *villi* or *velvet-like* covering, and it serves also, to retard the descent of the alimentary mass, and thus to afford more time, and more space, for the absorption and elaboration of the *chyle* by the lacteals. This operation takes place almost exclusively from the surface of the small bowels. These lacteals communicate freely in their deep seated and superficial branches. Those of the jejunum are larger, and more numerous than those of the ilium; the principal part of the chyle being contained by them. They take their origin, by open mouths, in the villi, and are composed of coats so thin, and transparent, that their name is derived from the *milky whiteness* of their contents, the chyle. They have valves, and thereby present the appearance as of joints, at regular distances, along their whole extent. They are so numerous, that at the time of their repletion, they conceal the blood-vessels, and form a beautiful network, from which are produced those of larger size, which perforate the lining membrane of the intestine. They pass, for a short way, between it and the muscular one; afterwards, they pass entirely through, from the inside to the outside, and are included with the intestine between the layers of the *mesentery*.

The *mesentery* is an extensive membrane, formed of a duplicature of the *peritoneum*, the internal covering of

the abdomen. It is attached to the vertebrae of the spine, posteriorly, and to the intestines, anteriorly. It contains adipose matter, the lacteals, mesenteric glands, lymphatics, arteries, veins, and nerves, which form a beautiful arborescent appearance, in its folds. It serves the important purpose of retaining the intestines in their proper position.

A plexus of lacteal vessels is formed within the folds of this mesentery; again, they radiate from it, and proceed onwards to the *mesenteric glands*, so called from their situation. (See *Fig. 5*.) They penetrate these glands, within which they freely unite; and then, on their progress, they meet with, and likewise penetrate, a second series of glands; and again emerging, they form by uniting, and converging, two or three trunks, which terminate in the oval shaped bag or sac, which serves as a reservoir or *receptacle of chyle*, and which is technically termed the *receptaculum chyli*. In this receptacle is also the termination of the trunk of the general absorbent vessels of the body; these are usually called the *lymphatics*, because of the pellucid fluid they contain. From this receptacle is formed, or arises, the *Thoracic Duct*, which ascends on the spinal column, and with the aorta, the great artery; and passes with it, through an opening in the diaphragm. Thus it enters the thorax or chest; it continues its course, still by the side of the aorta, as high as the fifth or sixth dorsal vertebra, when it passes over to the left side. It still continues upwards, and ultimately takes a direction more forwards, and downwards, and terminates its course at the place of union of the jugular and the subclavian veins. At its termination in these great veins, there are two valves, to prevent any

FIG. V.—View of the course of the Thoracic Duct, from its origin to its termination.



1. Lacteal vessels emerging from the mucous surface of the intestines. 2. First order of mesenteric glands. 3. Second order of mesenteric glands. 4. The great trunks of the lacteals emerging from the mesenteric glands, and pouring their contents into—5. The receptacle of the chyle. 6. The great trunks of the lymphatic or general absorbent system terminating in the receptacle of the chyle. 7. The thoracic duct. 8. Termination of the thoracic duct at—9. The angle formed by the union of the internal jugular vein with the subclavian vein.

return of the chyle, and any mixture of the blood with it in its duct. We here see that the chyle from the small intestines, and the lymph from every part of the body, are mingled into one fluid, and pass in this state of mixture, in the thoracic duct, to be again commingled with the venous blood, just before its arrival at the heart. This triple mixture is to be circulated by the right ventricle of the heart, for free exposure to the atmospheric air, in the lungs. Here we contemplate the simple arrangement of function, for the production of the most weighty results, and on which depends the continuance of life. We see the product of digestion and organized matter, and venous blood, in one fluid, taken to the right side of the heart, and by it, transmitted to the lungs, the arena of its great transformation into one uniform, vitalized fluid, *arterial blood*, to be propelled by the left ventricle into the arteries for circulation through the frame, to supply the purposes of life and organization.

CHAPTER VII.

THE LARGE INTESTINES AND THE KIDNEYS.

The office of the large intestines—The Cæcum, and its structure—Its lining membrane, and its secretion—The valve, and its office—The Colon, and its office for the secretion of fæcal fluid—The cause of constipation—The different portions of the Colon—The rectum, and its sphincter—Its lining membrane—Recapitulation of the process of digestion—Its progressive stages—The lymph of the Thoracic Duct—Its nature and use—The Kidneys, organs of excretion—Their office auxiliary to that of the lungs and of the skin—They eliminate azotized

matters—Their situation—Their duct the *ureter*—Its length, and diameter—Further recapitulation of the process and nature of digestion—Digestive solution—Digestive transformation—Chylification—Vitalization, and electricity concerned in it.

The large intestines, the remaining part of the alimentary canal, have an important office, which is to dispose of, in totally removing, the excrementitious matters from the body.

The Ilium, the last of the small intestines, opens into the cœcum, the first of the large ones; and a valve is formed by its manner of entrance. By some anatomists, the cœcum is considered the head of the colon, and they restrict the name of *cæcum* to a small worm-like gut, technically called the *appendix vermiformis*, which rises from the posterior part of the cœcum. This *appendix vermiformis* is of the size of a quill, and resembles the earth worm in figure. Its lining membrane has many mucous glands on it, and a thick mucous fluid is usually contained in its cavity. The valve is at the junction of the Ilium with the Cœcum, or *head of the Colon*, and is therefore termed, the *valve of the colon*. In the true office of a valve, it admits the descent of matter, but prevents its return.

The Colon is distinguished by its great capacity, and length of five feet, in the adult. To it belongs the important office of the first formation of fœcal matter, consisting of the excrementitious and insoluble residue of the food, and of the more liquid part, which is secreted or separated from the blood circulating on its lining membrane. The reader will readily perceive, that whatever deprives the colon of its due quantity of blood, will act also as a cause of costiveness of the bowels.

In diseased conditions of the upper organs of digestion, as of the stomach, and liver, there is an excess of blood in them, in their state of congestion, and a consequent deficiency of it in the structure of the colon, and lower organs. Hence we have constipation, or a stoppage of the fœcal secretion from the follicles of the colon. The Water treatment is the most efficient remedy of such unequal distribution of the blood; and hence its efficiency in correcting costiveness, by removing its cause.

It is necessary that my reader have a correct knowledge of the situation of the colon, and of its structure. It has its *ascending portion* on the right side of the abdomen; also a *transverse portion*, or *arch*, placed across the epigastric region; also a *descending portion*, which is on the left side of the abdomen. It has another portion resembling the letter S in shape, and therefore called *the sigmoid flexure of the colon*, and situated on the lower part of the left side. This *sigmoid portion* terminates in the *rectum*, the last of the *large intestines*.

The rectum occupies the hollow of the *sacrum*, the large bone at the end of the spine; and it is curved in shape, in correspondence with the curvature of the bone, and contrary to the meaning of its name. At the termination of the rectum, are strong muscular fibres, in a circular form, which constitute the *sphincter ani*, which closes the end of the gut. There is a marked difference between the structure of the lining mucous membrane of the large, and that of the small intestines; a difference also between that of the colon, and that of the rectum. By the arrangement of the lining membrane of the colon, it is formed into internal cells, which greatly

retard the descent of the mass contained in it. The internal membrane of the rectum is in large transverse plates, which disappear on the distention of the bowel by its contents.

The preceding description of the digestive organs has been as minute as our space would allow for it; and sufficiently so, perhaps, for the comprehension of my non-professional reader. From it he will obtain the essential knowledge of the physiology of digestion and nutrition, which will form the necessary basis of his correct understanding and appreciation of the Water Cure. He will have perceived by the preceding account of the structure, and operation of the digestive apparatus, and of the phenomena noticed, that the stages of digestion, and of blood-making, are marked, and progressive ones of approximation of the nature of the aliment, to that of the blood; from its mastication and insalivation in the mouth, to its absorption in the small intestines, and its elaboration by the lacteals and the lacteal glands, before its transmission by the thoracic duct, to be commingled with venous blood. The changes produced in the food, in this progressive approximation to the nature of blood, are effected by the gastric juice, and the secretions from the other organs, and the intestinal membrane, possessing highly animalized ingredients, and having assimilative properties; as the *saliva*, the *pancreatic juice*, and the *bile*, and the *secretion of the mesenteric glands*.

The lymph, with which the chyle is mixed in the thoracic duct, is ascertained to be of highly animalized nature. Its union with the chyle renders it fit for the further changes to be soon undergone, and making it

approximate more nearly to the nature of blood, previously to being mixed with it, and exposed to the operation of oxygen in the atmospheric air of the lungs.

The kidneys are not of the digestive organs ; but their function is so much in connexion with them, that we must not pass them unnoticed. Their state and operation, also, become an object of special consideration in the Water treatment ; and this, at least, entitles them to the account now to be given. They are organs of excretion ; and their office is to separate from the blood, the matters of certain azotized nature, whose complete and early removal from the system, is indispensably necessary. It is also auxiliary to that of the skin and lungs, to rid the system of superfluous fluid. This is apparent in the fact, that the quantity of it separated by the kidneys, is regulated by the amount of that by the skin. When its perspiration is diminished by exposure to cold, as in the winter season, the urine is increased ; and when, as in summer, or in hot climates, the perspiration is increased, the urine is diminished in quantity. The minute structure of the kidneys is of complex kind, but of striking beauty ; and of wise adaption to their twofold purpose, the separation of effete, *azotized matter*, which is always in proportion to the quantity of our *azotized food*, and the amount of waste going on in the system : and the separation of superfluous water, as already mentioned. They are placed in the lumbar regions ; one on each side. That on the right side, has a situation rather lower than that on the left, on account of the liver, which occupies the space above it. They are usually enclosed in a quantity of fat. From each kidney, there proceeds a proper secretory duct, or canal,

called *ureter*, of about eighteen inches in length, and of the diameter of a quill, which conveys the urine into the bladder.

Before we proceed to the consideration of the structure and function of the organs of respiration, let us take a retrospective glance at the progressive changes effected, by the digestive apparatus, on the alimentary substances subjected to their influence. The first important change in the condition of the food, is that of *solution*. Be it remembered, that no strictly insoluble substance can possess nutritious quality: also, that all nutriment consists of *organized bodies*, and that all organized bodies contain water. There is in them all, a certain quantity of water, which is essential to their existence, and which cannot be separated without their decomposition. They may also contain water in a state of dilution, which is an accidental constituent. The food is reduced to a semi-fluid and diluted state, by the agency of the gastric juice, in the stomach: but there is ever a special state given to it by the quality of the *solvent power*, which is in addition to its mere delution. This is a state conducive to the further progressive changes to be undergone by the food. This first essential change in the food we denominate, *digestive solution*.

Again, however numerous and different may be the varieties of food in the stomach, as soon as it becomes *chyme*, it also becomes homogeneous; of one uniform kind, and quality. Thus it is evident, that the stomach possesses the power of *transforming* its contents. Some of these changes can be effected, to an ostensible degree, even out of the stomach, by chemical manipulation; such as, *saccharine* substances into alcoholic or oleaginous

ones; and these, into the albuminous. The same changes, in a more perfect degree, take place within the body. This second change we denominate, *digestive transformation*.

After the solution and transformation of the food into *chyme*, it is absorbed, and elaborated into *chyle*, by the lacteals, and is transmitted into the mesenteric glands; it undergoes, in these glands, a further and refining process, which makes it of nearer approximation to the nature of blood. This is preparatory to its commixture with the lymph, to be conveyed with it, in the thoracic duct, for commixture with the venous blood, near the right side of the heart. This we denominate *chylicification*. This is the last operation, in the digestive process, on the alimentary substances. The food remains in the condition of *chyme* whilst in the intestinal canal, and it becomes *chyle* on its absorption and removal by the lacteals, and it is perfectly elaborated in the *mesenteric glands*. Lastly, it undergoes the wondrous change, called *vitalization*, only in the lungs, when under the vitalizing influence of the oxygen of the atmospheric air, and also under that of the *electricity*, ever contained in it. Thus, *chylicification* becomes the intermediate operation between the *chymification* and the last and distinct one of *vitalization*. This last and crowning one is distinct from digestion, and takes place away from the alimentary canal, and in the midst of central operations. Digestion is properly the first stage of the process of assimilation of food to the nature of blood, and is confined to the intestinal canal; and comprehends *solution* and *transformation of food*. Let us reflect also, that this takes place *exterior* to those vital organs of the body,

which constitute the grand assimilating and vitalizing apparatus. We may assume, that the greatest extent of change effected in the food, whilst in the intestines, is not much, if at all, beyond what might be accomplished by artificial digestion, entirely out of all contact with the body. We may safely conclude from analogy, that this properly so called digestion in the intestines, consists principally of mechanical and chemical changes, and is proper *chymification*. It seems more correct and philosophic, to ascribe the intermediate change of food into *chyle*, to the higher range of physiological action, which takes place in the lacteals and mesenteric glands. In this sphere of operation some lower degree of vitality may be possibly imparted, in *chylification*; but the last and crowning act of *vitalization*, it undergoes in commixture with the lymph, and venous blood, whilst under the combined action of *oxygen and electricity* in the lungs. This is an agency of special character, and beyond the keenest philosophy of man to scrutinize.

CHAPTER VIII.

THE LUNGS.

The lungs are the arena of important changes—These are necessary for the ultimate nutrition of the body—The *change of tissue*—Proofs of Divine wisdom and power—Nutrition subserved by the previous processes—The cause of all diseases is in unhealthy nutrition—The Larynx or air tube—The Trachea and the Bronchial tubes and air cells—The structure of the lungs—Their situation and lobes—The *rete mirabile* of the air cells—The Oxygen of the Atmospheric air and its agency in the air cells, and in all parts of the body—Calorification or generation

of animal heat—Its principal cause in the *change of tissue*—Its regulation by exhalation—In much less degree from that of the lungs than from that of the skin.

The lungs are the arena on which the perfect assimilation of the product of food to vital arterial blood, takes place. In the form of *arterial blood*, it is distributed to the utmost limits of the body, to supply the *waste of tissue* continually going on. The lymph, and the venous blood, with which the chyle is commingled, just before their entrance into the lungs, do each also undergo respective changes there. The lymph becomes more highly animalized, and in conjunction with the chyle, contributes nutriment. The venous blood is deprived of its effete and noxious matters, brought from the *waste of tissue* throughout the system. A perfectly homogeneous and vitalized blood is carried to the left side of the heart, to be circulated by it, through the innumerable arteries, for all the purposes of life and organization. For, living substances only, can unite to form a constituent part of the living body. Nothing can be more calculated to strike the reflective mind, than is this marvellous arrangement for the security of the health and existence of man. Surely mindless and thoughtless must be the human being, who can say in the face of so much evidence of design, and wisdom, and power, and goodness divine, "there is no God."

Although the communication of living principle to the ultimate product of food, is an indubitable fact, the real agent and mode of its accomplishment are not fully ascertained; and physiologists have hitherto deemed it a subject of inscrutable nature, and likely to remain beyond the sphere of human knowledge. Nevertheless

there is ground for supposing, from analogy and experience, that the phenomena of life and organization have their chief dependance on electrical changes and conditions. This is in accordance with the ideas of the philosophic and philanthropic Stevens, who has effected so much in practical science.

The three functions of digestion, respiration, and the circulation of the blood, constitute the means by which is effected the *nutrition* of the human body; and by which is maintained the efficiency of its wonderful organism. On their due and perfect performance depends the physical and mental well-being of the individual; and it is a fundamental doctrine of Hydrophathy, that all diseases, and especially, all of a chronic kind, have their original source in the unhealthy state of the organs of nutrition, and invariably implicating their system of nerves, the *organic* or *ganglionic*, by which their function is performed. Of this all important subject we have to enlarge, in due time and place.

We now proceed to describe the organs of respiration, that process by which the chyle is brought in contact with the atmospheric air, and is thereby fitted for the purpose of supply to the body. The air is conducted to the lungs through the air tube, which, at its top, or commencement, is called the *larynx*, in which is the apparatus of speech, and the *trachea*, which divides into the *bronchial tubes*, and these again subdivide, and terminate in the *air cells*, of which the entire substance of the lungs consists. In the cavity of these air cells is the secret laboratory, in which is carried on the wondrous vital chemistry, so to speak, by which the changes so often alluded to, are effected.

The structure of the lungs is, in some measure, similar to that of sponge, and may be known to the reader, as seen in the lower animals. There is one lung to each side of the chest, which they occupy respectively. Each lung is partially divided, by fissures, into lobes. That in the right cavity of the chest, has, in this way, three lobes, or divisions; that on the left, has but two, because of the heart, which occupies a central part of it.

The triple fluid, consisting of *chyle*, and *lymph*, and *carbonized venous blood*, is sent to the lungs for the needful exposure to atmospheric air. This takes place through the medium of the very fine lining membrane of the *air cells*, well named the *rete mirabile*, which admits of the diffusion of gases. In this way, the discharge of noxious materials of the body, and the admission of vital and nutritious elements, are accomplished at the same time, and by the same means. The contact of the atmospheric air with the blood, in the *air cells*, produces an alteration in the quality of both. Pure air is composed of two gases, *azote* or *nitrogen*, and *oxygen*, and always in fixed proportions. There are also, in variable quantity, other substances diffused, or mixed with atmospheric air; *carbonic acid gas* and *aqueous vapor*. But the oxygen has essentially to do with the chemical changes continually going on in respiration. It is also named *vital air*, because no animal can live many minutes without it. In its diluted state in the atmospheric air, it is the grand *pabulum vite* of animal existence on the globe.

It is demonstrated, that in its contact with the venous blood in the lungs, a part of the oxygen of the air, combines with the carbon of the blood, to form carbonic acid,

there is ground for supposing, from experience, that the phenomena of nutrition have their chief dependance on external conditions. This is in accordance with the philosophic and philanthropic Spirit effected so much in practical science.

The three functions of digestion, respiration, and circulation of the blood, constitute the process which is effected the *nutrition* of the human organism, which is maintained the efficiency of the organism. On their due and perfect performance depends the physical and mental well-being of man, and it is a fundamental doctrine of Hygiene that all diseases, and especially, all of a chronic nature, have their original source in the unhealthy state of nutrition, and invariably implicating the nervous system, the *organic* or *ganglionic*, by which nutrition is performed. Of this all important subject we shall enlarge, in due time and place.

We now proceed to describe the organic process that process by which the chyle is brought into contact with the atmospheric air, and is thereby converted into the purpose of supply to the body. The air enters the lungs through the air tube, which, at its commencement, is called the *larynx*, in which takes place the act of speech, and the *trachea*, which branches into the *bronchial tubes*, and these again subdivide into the *air cells*, of which the entire substance of the lungs consists. In the cavity of these *air cells*, the secret laboratory, in which is carried on the vital chemistry, so to speak, by which the blood is often alluded to, are effected.

which is given off in expiration, along with the *nitrogen* inspired ; that another portion of the *oxygen* combines with the *hydrogen* of the blood, to form *water*, which is also given off ; and in like manner, combinations of *oxygen* take place with the *sulphur* and *phosphorus* of the chyle, to form *sulphuric* and *phosphoric acids*, to be ultimately excreted by the kidneys ; and a portion combines with the arterial blood, for its chemico-vital action on the ultimate tissues of the body. In connection with the function of the lungs, is that of *calorification*, or the *generation of animal heat*. A certain, and uniform amount of temperature is requisite for the due performance of the vital processes of warm blooded animals. In the arrangements for providing this to the wants of the animal economy, for the regulation of animal heat, we behold the unfailing and consummate wisdom of the beneficent Creator ; the perfect adaptation of means to the end, and means which are *simple* and *efficient*, to ends, which are *vast*, and *important*.

The standard degree of temperature of the human body is 98° , and any deviation from this is very unusual, under all the various circumstances of human existence. It does not exceed 3° or 4° of diminution or increase by the most powerful causes that can affect it. There is ever an existing relation between the temperature of the body and the rapidity of the circulation of the blood, and also of respiration. As an example of this, we may refer to the case of disease of the lungs. In consequence of the more rapid respiration in many of such cases, the temperature of the body is increased, and that of the skin is sometimes unusually high, notwithstanding that the lungs may be greatly wasted. Again, in

evidence of diminished temperature, we allude to cases of disease, in which the circulation of the blood through the lungs, or the entrance of atmospheric air, is impeded, as in asthma, and in fainting; also in cholera, in which the temperature is reduced to the coldness of death.

From the wonderful power of compensation, and regulation, implanted in the human system by Infinite Wisdom, we find that man can exist in health under the greatest extremes of external temperature. In the torrid zone of 110° to 120° , and in the frigid zone, in from 60° to 80° below zero. In every part of the world, we find man in health, and provided for, according to his actual wants. His indulgence of his own depraved passions alone curtails his happiness. The subject of animal heat is so greatly concerned in the philosophy of the Water Cure, that we entreat the attention of the reader to its consideration.

In the language of Liebig "All living creatures, whose existence depends on the absorption of oxygen, possess within themselves a source of heat independent of surrounding objects." This truth applies to all animals, and extends besides, to the germination of seeds, to the flowering of plants, and to the maturation of fruits. It is only in those parts of the body to which arterial blood, and with it, the oxygen absorbed in respiration, is conveyed, that heat is produced. Hair, wool, or feathers do not possess an elevated temperature.

This high temperature of the animal body, or, as it may be called, disengagement of heat, is uniformly, and under all circumstances, the result of combination of a combustible substance with oxygen.

The cause of heat the most prevalent in the human

body, is the combination of the oxygen inspired, with carbon: and especially, with that of the ultimate textures, and during the *change of tissue*.

The degree of heat produced will be in proportion to the rapidity of the combination; to the quantity of oxygen consumed, and of carbonic acid given off. The generation of it is continually going on in all parts of the living body, in which *chemical changes* are taking place: the *change of tissue* is a ceaseless source of it, as it is also of physical power, and of mental vigour. My reader will readily understand, that exercise in the open air causes increase of temperature, by increasing the rapidity of respiration, and of the circulation of blood, and thereby causing a more rapid absorption of oxygen, and its consequent combinations.

The chief means of regulating the temperature of the body, is in the *exhalation of the skin*. Excessive heat causes increased secretion of fluid by the glands of the skin: the water passes off in evaporation, and takes with it the caloric, or heat, which is needed for its state of vapour. The exhalation from the lungs also regulates, in this way, the temperature of the body, but in much less degree than that of the skin.

CHAPTER IX.

THE HEART AND ARTERIES.

The position of the heart—The pericardium and its secretion—
The two halves of the heart—Its auricles and ventricles—Their
structure and different uses—The pulmonic circle of circulation
—The systemic circle of circulation—The double circle of circu-

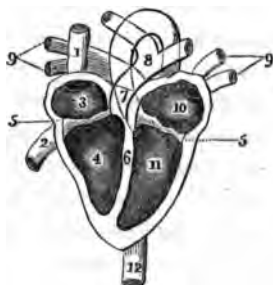
lation—The valves, and their wise adaptation—The quantity of blood, and other interesting particulars of the circulation—The systole and the diastole of the heart—The great object accomplished by the capillary circulation of arterial blood, with that of the veins—The *change of tissue* and the *generation of animal heat*—Liebig's account of these two great functions—Recapitulation of their production and effects—Remarkably verified in the Water Cure—The Winter best for Water treatment.

The last of the three great functions subserving the nutrition of the human body, is the circulation of the blood ; and it is performed by the heart and arteries. The heart is placed between the two lungs, but more to the left side. It occupies an oblique position, its base being upwards, and towards the right, and its apex, or point, is downwards, and towards the left, and can be felt in its action, between the cartilages of the fifth and sixth ribs, It is contained in the *pericardium*, a bag of serous membrane. It is seen in connexion in *Fig. 4*.

This bag is kept in a moist state by its own secretion of *serum*, during life, and after death, it is as a small quantity of limpid fluid. In dropsical states of the body, this fluid is sometimes increased to a larger quantity, and becomes the mechanical cause of distressing symptoms. In the circulation of the blood, the heart is the propelling organ ; the arteries in connection with it, are the transmitting organs. It consists of two halves. The right side, or half, receives the venous blood, brought from all parts of the body, and its ventricle propels it to the lungs for depuration ; the left one receives the vital and depurated blood from the lungs, and its ventricle propels it to be circulated through the whole body. Each of these halves of the heart consists of two chambers, or cavities,

an *auricle* for receiving, and a *ventricle* for propelling the blood. See *Fig. 6*. The walls of the *ventricles* are composed almost entirely of muscular fibres, and are strengthened internally by irregular masses or bundles of them, which stand out from the internal surface, as fleshy pillars, or columns; hence, there anatomical name, *calumnæ carnæ*. This structure adapts each ventricle for its office. The *auricles* are principally membranous, with but little of muscular texture; but are equally adapted for their office of receiving. To each *auricle* is connected a *vein*, and to each *ventricle* an *artery*. The large veins called the *superior vena cava* from the upper part of the body, and the *inferior vena cava* from the lower parts, pour their blood into the *right auricle*. From this it passes into the *right ventricle*, from which arises the *pulmonary artery*, which carries the blood into the lungs: this is called *the pulmonic circle of circulation*. The *venous* blood becomes *arterial* by its exposure to the atmospheric air in the lungs: and is then returned to the left auricle by the *four pulmonary veins*. It then passes into the *left ventricle*, from which arises the great artery, the *aorta*, by which it is propelled, at each pulsation, to the whole system: this is called *the systemic circle of circulation*. In all the different parts of the body the capillary arteries have their termination at the commencement of the capillary veins, which gradually enlarge in their caliber, and unite as they proceed, until they ultimately form the *venæ cavae*; and thus the *double circle of circulation* of the blood is formed. At every entrance and exit of the blood *into* and *out of* the heart, there are perfect *valves*, which effectually prevent any backward course of the blood. In the peculiar arrangement of

FIG. VI.—*View of the heart with its several chambers exposed and the great vessels in connection with them.*



1. The superior vena cava. 2. The inferior vena cava. 3. The chamber called the right auricle. 4. The chamber called the right ventricle. 5. The line marking the passage between the two chambers, and the points of attachment of one margin of the valve. 6. The septum between the two ventricles. 7. The pulmonary artery arising from the right ventricle, and dividing at 8, into right and left for the corresponding lungs. 9. The four pulmonary veins bringing the blood from the lungs into 10, the left auricle. 11. The left ventricle. 12. The aorta arising from the left ventricle, and passing down behind the heart to distribute blood, by its divisions and subdivisions, to every part of the body.

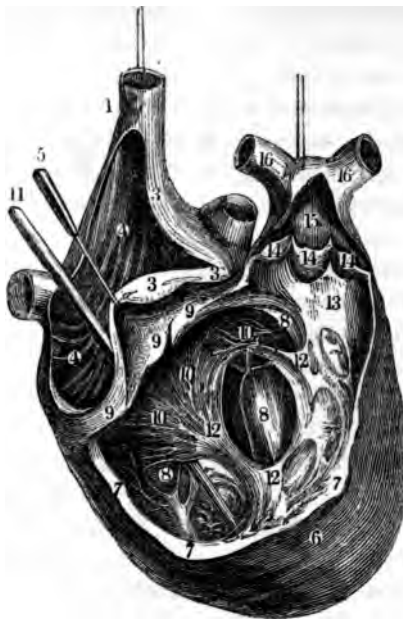
these valves is seen the strongest proof of the perfect wisdom and superintending care, which have so effectually provided for every want of the human mechanism. In addition to their perfect construction *as valves*, they are so formed that one edge, or margin of each, adheres to the internal walls of the cavity ; whilst the other part of it, when not in use, is free and loose. It is evident, that were the whole of it loose, it would be borne backwards by the current of blood, and thus be useless in its action. There is every demonstration of wisest design in the anatomy and physiology of the human heart. By the contraction of its muscular substance, it propels the blood with a force equal to the pressure of sixty pounds. Two ounces of blood are sent into the aorta at every contraction, and this takes place four thousand times every hour. Thus we calculate, that eight thousand ounces, or seven hundred pounds of blood pass through the human heart every hour. The average quantity of blood, in an adult human being, is about twenty-eight pounds. The complete circulation takes place in two minutes and a half. Thus we arrive at the conclusion, that from twenty, to twenty-four times the quantity of the whole mass of blood in the individual, passes through it in the hour.

The auricles and ventricles are uniform in their actions. The auricles contract, and thereby diminish their cavity ; they then dilate, and thereby, it is expanded. The ventricles do the same. The contraction is called the *systole*, and the expansion the *diastole* of the heart, by physiologists. This action is in regular alternation, and at equal intervals. Thus they go on incessantly, without rest, and equally without

exhaustion, or the least degree of fatigue, for a period of three score years and ten, or even for four score years. This, on every consideration, is truly wonderful, and tells, with trumpet tongue, that the maker of this exquisite mechanism is Divine. No anatomist can discern the least difference between the muscular substance of the heart, and that of the limbs. We know how the muscles of the limbs are tired, and exhausted by labour; and even, beyond the power of further action. True it is, that the action of one is *involuntary*, and that of the other is under the influence of the will: but, this does not explain to us why the external muscles require rest and sleep, whilst those of vital, and involuntary action never rest, till the rest and sleep of death. It is the fiat of Omnipotence.

The left ventricle of the heart propels the blood into the aorta, and through it, into the other arteries of the body. They are always distended with blood during life, and invariably become hollow empty tubes at death. They are of strong and elastic structure, much beyond that of the veins. Already in a state of distension, they receive the injection of blood, by each contraction or *systole* of the ventricle; and this causes the current of blood to pass along them in the mode which constitutes the *pulsation*.

The circulation of the blood is for the ultimate purpose of nutrition; in the supply of nutrient matter for the living solids and fluids of the body, by the capillary arteries: and, conjointly with the function of respiration, in the *change of tissue*, and in the *generation of animal heat*: and for the removal of the waste matter by the veins, to the right side of the heart; and by it, to the



View of the heart with the great vessels in connection with it, on the right side, its different chambers being laid open and its structure shown. 1. The vena cava superior; 2. the vena cava inferior; 3. cut edge of the right auricle turned aside to show, 4. the cavity of the right auricle into which the two venæ cavae pour the blood returned from all parts of the body; 5. hook suspending the reflected portion of the wall of the auricle; 6. the right ventricle; 7. cut edge of the wall of the ventricle, a portion of which has been removed to show, 8. the cavity of the ventricle; 9. situation of the opening between the auricle and ventricle, called the auricular orifice of the ventricle; 10. valve placed between the auricle and ventricle, one margin being firmly attached to the auriculo-ventricular opening in its entire extent, the other lying loose in the cavity of the ventricle; 11. probe passed from the auricle into the ventricle underneath the valve, showing the course of the blood from the former chamber to the latter; 12. the columnæ carneæ attached by one extremity to the walls of the ventricle, the other extremity ending in tendinous threads attached to the loose margin of the valve; 13. passage to the pulmonary artery; 14. the three semilunar valves placed at the commencement of 15. the pulmonary artery; 16. the two great branches into which the trunk of the pulmonary artery divides, one branch going to each lung.



View of the heart with the great vessels in connection with it, on the left side, its chambers being laid open as in the preceding figure. 1. The four pulmonary veins opening into, 2. the cavity of the left auricle; 3. the cut edge of the wall of the auricle; 4. the appendix of the auricle; 5. the cavity of the left ventricle; 6. the cut edge of the wall of the ventricle, the greater portion of the wall having been removed to show the interior of the chamber; 7. valve placed between the auricle and ventricle; 8. columnæ carneæ terminating in tendinous threads attached to the loose margin of the valve; 9. probe passed underneath the valve and its tendinous threads, raising them from the wall of the ventricle similar to a reflux current of blood: 10. passage to 11. the aorta; 12. two of the semilunar valves placed at the mouth of the aorta, the third having been cut away; 13. arch of the aorta; 14. the three semilunar valves at the commencement of the pulmonary artery seen in action, completely closing the mouth of the vessel.



lungs, for its elimination, as mentioned before, and to be again referred to. On this interesting subject we take a few observations from the work of Liebig, who has written so clearly on Chemistry in its applications to Physiology and Pathology.

“The first conditions of animal life are nutritious matters and oxygen, introduced into the system.

At every moment of his life, man is taking oxygen into his system, by means of the organs of respiration ; no pause is observable while life continues.

The observations of physiologists have shewn that the body of an adult man, supplied with sufficient food, has neither increased nor diminished in weight at the end of twenty-four hours ; yet the quantity of oxygen taken into the system during this period is very considerable.

According to the experiments of Lavoisier, an adult man takes into his system, from the atmosphere, in one year, 746lbs.; according to Menzies, 837lbs. of oxygen; yet we find his weight, at the beginning and end of the year, either quite the same, or differing, one way or the other, by at most a few pounds.

What, it may be asked, has become of the enormous weight of oxygen thus introduced in the course of a year, into the human system ?

This question may be answered satisfactorily ; no part of this oxygen remains in the system ; but it is given out again in the form of a compound of carbon or of hydrogen.

The carbon and hydrogen of certain parts of the body have entered into combination with the oxygen introduced through the lungs and through the skin, and have been

given out in the forms of carbonic acid gas and the vapour of water.

At every moment, with every expiration, certain quantities of its elements separate from the animal organism, after having entered into combination, within the body, with the oxygen of the atmosphere.

If we assume, with Lavoisier and Seguin, in order to obtain a foundation for our calculation, that an adult man receives into his system daily $32\frac{1}{2}$ oz. of oxygen, and that the weight of the whole mass of his blood, of which 80 pr. cent. is water, is 24 lbs. ; it then appears, from the known composition of the blood, that in order to convert the whole of its carbon and hydrogen into carbonic acid and water, 64.103 grains of oxygen are required. This quantity will be taken into the system of an adult in four days, two hours.

Whether this oxygen enters into combination with the elements of the blood, or with other parts of the body containing carbon and hydrogen, in either case the conclusion is inevitable, that the body of man, who daily takes into the system $32\frac{1}{2}$ oz. of oxygen, must receive daily in the shape of nourishment, as much carbon and hydrogen as would suffice to supply 24 lbs. of blood with these elements ; it being presupposed that the weight of the body remains unchanged, and that it retains its normal condition as to health.

This supply is furnished in the food.

From the accurate determination of the quantity of carbon daily taken into the system in the food, as well as of that proportion of it which passes out of the body in the fæces and urine, unburned, that is, in some form in which it is not combined with oxygen, it appears that

an adult, taking moderate exercise, consumes 13·9 oz. of carbon daily.

These 13·9₁₀ oz. of carbon escape through the skin and lungs as carbonic acid gas.

For conversion into carbonic acid gas, 13·9₁₀ oz. of carbon require 37 oz. of oxygen.

According to the analyses of Boussingault, a horse consumes in twenty-four hours, 97½ oz. of carbon, a milch cow, 69₁₀ oz. The quantities of carbon here mentioned are those given off from the bodies of these animals in the form of carbonic acid; and it appears from them that the horse consumes, in converting carbon into carbonic acid, 13lbs. 3½ oz. in twenty-four hours, and the milch cow 11lbs. 10¼ oz. of oxygen in the same time.

Since no part of the oxygen taken into the system is again given off in any other form but that of a compound of carbon or hydrogen; since further, the carbon and hydrogen given off are replaced by carbon and hydrogen supplied in the food, it is clear that the amount of nourishment required by the animal body must be in a direct ratio to the quantity of oxygen taken into the system.

Two animals, which in equal times take up, by means of the lungs and skin, unequal quantities of the oxygen, consume quantities of the same nourishment which are unequal in the same ratio.

The consumption of oxygen in equal times may be expressed by the number of respirations; it is clear that, in the same individual, the quantity of nourishment required must vary with the force and number of the respirations.

A child, in whom the organs of respiration are

naturally very active, requires food oftener than an adult, and bears hunger less easily. A bird, deprived of food, dies on the third day, while a serpent, with its sluggish respiration, can live without food three months and longer.

The number of respirations is smaller in a state of rest than during exercise or work. The quantity of food necessary in both conditions, must vary in the same ratio.

An excess of food is incompatible with deficiency in respired oxygen, that is, with deficient exercise ; just as violent exercise, which implies an increased supply of food, is incompatible with weak digestive organs. In either way the health suffers.

But the quantity of oxygen inspired is also affected by the temperature and density of the atmosphere.

The capacity of the chest in an animal is a constant quantity. At every respiration a quantity of air enters, the volume of which may be considered as uniform ; but its weight, and consequently that of the oxygen it contains, is not constant. Air is expanded by heat, and contracted by cold, and therefore equal volumes of hot and cold air contain unequal weights of oxygen. In summer, moreover, atmospherical air contains aqueous vapour, while in winter it is dry ; the space occupied by vapour in the warm air is filled up by air itself in winter ; that is, it contains, for the same volume, more oxygen in winter than in summer.

In summer and in winter, at the pole and at the equator, we respire an equal volume of air ; the cold air is warmed during respiration, and acquires the temperature of the body. To introduce into the lungs a given volume of oxygen, less expenditure of force is necessary in winter than in summer ; and for the same

expenditure of force, more oxygen is inspired in winter.

It is obvious, that in an equal number of respirations we consume more oxygen at the level of the sea than on a mountain. The quantity both of oxygen inspired and of carbonic acid expired, must therefore vary with the height of the barometer.

The oxygen taken into the system is given out again in the same forms, whether in summer or in winter ; hence we expire more carbon in cold weather, and when the barometer is high, than we do in warm weather ; and we must consume more or less carbon in our food in the same proportion ; in Sweden more than in Sicily ; and in our more temperate climate a full eighth more in winter than in summer.

Even when we consume equal weights of food in cold and warm countries, Infinite Wisdom has so arranged, that the articles of food in different climates are most unequal in the proportion of carbon they contain. The fruits on which the natives of the south prefer to feed, do not, in the fresh state, contain more than 12 per cent. of carbon, while the blubber and train oil used by the inhabitants of the arctic regions, contain from 66 to 80 per cent. of carbon.

It is no difficult matter, in warm climates, to study moderation in eating, and men can bear hunger for a long time under the equator ; but cold and hunger united very soon exhaust the body.

The mutual action between the elements of the food and the oxygen conveyed by the circulation of the blood to every part of the body, is the source of animal heat."

I have taken this account of the action of oxygen in nutrition and the *transformation of tissue*, from Liebig's

work, because of its importance and bearing on our subject, the Water Cure, and the evident conclusions to be drawn in support of it.

The reader must keep in mind, that the heat of the body in health, remains of the same degree in all climates, and in all seasons of the year. That like all other bodies, the human frame gives out its heat with a rapidity in proportion to the degree of coldness with which it may be surrounded : that heat is ever tending to its equal distribution among bodies : those containing more of it, are continually giving out to those which have less ; and which, of course, are continually taking it in, until the equal temperature of all be established.

Animal heat, is produced by the *transformation of tissue*, and the amount and rapidity of its production are in proportion to the amount and rapidity of the transformation effected, as stated above. Therefore, by cooling the body, as in the Water treatment, we cause a demand in it for a proportionate reproduction of heat : we cause a greater rapidity of *transformation of tissue* ; a demand for more oxygen by the lungs ; a demand, through hunger, for more carbon and hydrogen in the food : a demand for increased activity in the functions of digestion, respiration, and nutrition. The effect produced on the whole system is increased vigour of body and mind, because the perpetual newness and healthiness of the entire structure are preserved.

This established principle of animal chemistry is remarkably verified, to the purpose of correcting the diseased conditions of the human body, by the Water treatment. By the repeated abstraction of heat, in the use of the Water cure appliances, with the water drink-

ing, ever according to the case, by exercise in the open and pure air, by light clothing, and the suitable regulation of diet, the great purposes are answered for the removal of disease, in exalting the energy of *organic vitality*, by which alone it is effected. The chemical agency of the treatment is seen in the numerous cases brought under it: in the rapid transformation of the tissues, the old and morbid materials are broken up; and, according to Liebig's decisive doctrine, they become united with the all-powerful oxygen, and are removed by such outlets of the body, as are most suitable for their elimination; and new and healthy particles take their place, where they are required. The healthy performance of the various functions is substituted for that which was previously unhealthy, and impeded. The appetite is increased; the action of the digestive organs becomes more vigorous; the various secretions and excretions are duly performed; and the body and mind become vigorous, from the continual freshness and purity of the constituent particles of the former, as noticed before. This correct doctrine of animal chemistry also demonstrates, why we can effect the greatest cures by Water treatment during winter.

The fact of the great and decided superiority of the winter season, and of cold weather, for the cure of disease by water treatment, is not sufficiently considered by invalids; although it is stated in the works of its professional practitioners: for the hydropathic establishments at Malvern, and other places, are ever most crowded during the summer; when the warm and rarified atmosphere becomes comparatively unsuitable for bringing out the greatly renovating and remedial power of the Water Cure. All its extraordinary cures have been

effected in cold weather : and, that then its chemical agency will be most powerful, is an evident conclusion from the statements of Liebig, just quoted. Let my reader remember it, and be wise to act on it.

CHAPTER X.

THE SKIN.

The best medium of remedial operations—Allopathic practitioners have neglected it—Surprising that they have not thought more of the skin—The offices of the skin—Its structure—The dermis—The rete mucosum—The cuticle or scarf skin—The vascular plexus—The nerves of the skin—Its absorbents—The sebaceous follicles, and the scent—The hair, and its bulbs—The nails—The sense of touch—The perspiration, sensible and insensible—The skin and the internal mucous membrane but a continuation of each other—a great fact of physiology, and ever regarded in the Water Cure.

The Skin has a special claim to our particular consideration. It is the great medium of Hydropathic treatment ; and it is the most suitable for remedial purposes, because of its extent, and structure, and its important offices, as a sentient, absorbing, and excreting organ, which has such direct, and intimate sympathy with, and powerful influence over every other of the body. Any interruption of its healthy actions very soon disturbs the harmony of the whole animal system ; and congestion, or fever, or inflammation of internal parts, is the consequence. The state of the skin, as an index of that of the body under disease, has long been attended to, by the skilful practitioners of medicine. Yet they have, only to a very limited extent, availed themselves of it,

for the application of remedies. These have chiefly consisted in blisters, and moxas, and liniments, and embrocations, with issues, and setons. Of later years, also, and since the practice of Currie at Liverpool, cold affusion, and other partial use of cold water in fever, have been resorted to: but hot fomentations have long been used in other affections. Yet, the skin, as the most extensive, and most suitable part of the body, for the application of remedies, in its diseased states, has been disregarded by them. On consideration of its connections, and influence, it seems a striking circumstance that they have not turned to more account their knowledge of the same: and, that certain pathological connections have not secured more attention to the surface of the body, as a medium of treatment. The long known fact of critical sweats, carrying off many acute diseases; moreover, how remarkably the external parts of the skin become the great derivatives or safety valves, in many diseases; as in gout, and in rheumatism; also in exanthematous disorders; as in small pox, and scarlet fever, and measles; besides, in many chronic complaints of the internal viscera, which find relief in various eruptions on the skin. We here leave the point; but under the impression, that a great error is in the choice of exclusive and severe drug practice, and that it is often fraught with mischief.

The skin has different, and important offices; but its chief one is that of an emunctory, or organ of excretion. It is classed, in this respect, with the lungs, the liver, the kidneys, and the intestinal canal. These also, have other purposes to serve. It is composed of three layers; the internal one is the *dermis*, or *true skin*; the middle

one is the *rete mucosum*, of anatomists ; and in it is the seat of colour, in the Negro : the *scarf skin* or *cuticle* is the external layer, and varies in condition and thickness. In the palms of the hands, and the soles of the feet, it acquires great thickness, and according to the pressure applied ; as in those who labor and walk much. The non-professional reader must remember, that the *dermis*, or *true skin*, has over its external surface, the *vascular plexus* or network, consisting of minute, and innumerable blood vessels, and endless numbers of nerves accompanying them ; these nerves are of both kinds, *organic* and *animal*, or *insentient* and *sentient* ; the former enable the *capillary arteries* to perform the principal function of the skin, that of excretion. The animal or sentient nerves give to every part of the cutaneous surface that extreme sensibility which it possesses. There are also innumerable absorbents, having their terminations with these arteries and nerves. In the skin are placed the *sebaceous follicles*, of anatomists : they form the oily matter, which gives to the healthy skin its softness and smoothness. In this oily matter is the odour or scent, which is perceptible in certain states of the system, especially implicating the nerves, as in the insane.

The dermis is perforated by the hairs ; this is in an oblique direction, and beneath, are the bulbs from which the hairs arise, and in which alone their growth takes place. Each human hair is made up of a number of fine tubes, in which is the oily matter, whose colour gives that of the hair. I may here just notice the arch roguery, which is so constantly addressing itself to the ignorance and weakness of human nature, in professing to furnish certain matters, under cunningly devised

names of—*oil* and *cream* and *balm* and *bears grease*, and so on, for the growth of the hair ! as if any external local application could furnish *nervous power*, on which alone the growth of the hair depends : never was there one single hair produced by such means ; and most certainly, there never will be. The physiological fact, that its growth is in intimate dependance and sympathy with the state of the *nervous system*, is demonstrated continually. We know that sorrow and mental anxiety have always great influence on it, and even in a few hours ; as often seen at the French revolution of last century, when many of the unfortunate victims had their hair changed from black to white, or gray, during the few hours of their imprisonment, whilst in expectation of violent death. We do occasionally see a great improvement produced in the condition of the hair, by a course of Water treatment, in those of suitable age : and this is very intelligible ; seeing, that no other means has so markedly an invigorating and renovating influence on the nervous system. But the pretence of furnishing any kind of matter whatever, to make the hair grow, is one of the many impudent schemes to extract money from the vain, and the ignorant. The spread of physiological knowledge of the nature of health, and of disease, will put an end to the prosperous system of lying, and deceiving, now practised on so many, who thus pay a penalty for their ignorance. My reader, I trust, will escape.

The nails are formed by the dermis, and are identical with the cuticle, or scarf skin. This cuticle, or scarf skin, is insensible, and inorganic, or lifeless, like the nails. It thus serves admirably for the purpose of protecting

the very sensitive parts beneath it. The skin is the great seat of external sensation, by which we are apprized of the contact of external objects. But the special seat of the *sense of Touch* may be said to belong to the tips of the fingers, which are finely organized for the purpose. How correct is the adaptation, in every respect, and what constant need we have of the sense, in the parts on which it is located! In every stage of our investigation of the anatomy and physiology of the human body, we meet with the most exact and wise contrivance to the purpose intended, and all of surpassing excellence!

My reader, the Water patient, must remember, that the skin is chiefly an organ of excretion; but it is also in an important degree, an organ also of absorption and secretion, and an organ of sense. It is the seat of three different functions performed by the *organic insentient nerves*, and of one performed by the *animal or sentient nerves*.

In special connection with the Water Cure, is this subject of the skin and its functions; therefore we give to it a more particular consideration. The main excretion of the human skin is usually termed perspiration. It is *sensible* and *insensible*. The former is called, *sweat*, the latter is a vapour, which is usually invisible; but it is always going on; whereas, the *sensible perspiration* is only occasionally formed. My reader will mark, that the quantity of matter removed from the body by the *insensible perspiration*, is much larger than that of the other; and, that more than four times the amount of matter is carried out of the system by the skin, every day, than by the bowels.

The perspiration is separated from the blood by

transudation. This matter transuded on the skin, is removed from it by evaporation : a liquid is converted into a state of vapour, and for this change of condition, a certain quantity of *caloric* or *heat* is added, and becomes *latent*, being taken from the skin. This process of perspiration thus becomes a *cooling one*, and was treated of before, on the subject of the *regulation of animal heat*.

Further let us remember, that modern chemists have proved by their tests, that different substances are contained in the watery fluid, which constitutes the largest part of the matter of perspiration. There is an acid, and a small quantity of animal matter ; also alkaline and earthy salts ; also an oily matter, in minute quantity, and probably, of the sebaceous follicles. These are nearly the constituents of the serum of the blood. We must also notice, that the skin, in contact with the air, separates carbon from the blood ; and thus acts as an auxiliary to the lungs. Further, also, is its office of excretion, to remove superfluous hydrogen from the blood.

The skin may be said to extend as a lining to the cavities and passages of the body, which have communication with the external air ; the internal mucous membrane being but a continuation of the external covering. Truly their sympathies are most intimate, and their actions on each other are reciprocal, especially in their diseased states. This is a great physiological fact of their connection, and turned to valuable account in the practice of the Water Cure. The greater part of acute diseases have their primary cause in the obstructed function of the internal and external coverings of the human body : also the most intractable forms of

chronic ailments. And no wonder because of it, when we consider the innumerable pores, so thickly set, in their structure: through these pores, are incessantly drained from the body, the noxious and effete matters, whose removal is indispensable for the well-being of the vital mechanism; whose undue retention would cause derangement and disease. Every thing that enters the living body, must pass by the route of these structures.

CHAPTER XI.

THE ELIMINATING FUNCTIONS OF THE SKIN, AND THE LIVER, AND THE LUNGS.

These are the three emunctories of carbon and hydrogen—They become vicarious and compensative in their functions—The liver becomes supplementary to the lungs and skin—In disease of the lungs, the increased action of the liver—Tropical climates afford illustration—And the summer season of our own country—The wrong habits of Englishmen in India—Its consequences—Quotation from Wilson—The Water treatment in these cases of over-wrought organs—The same fault of dietetic habits in England as in tropical climates—The account current—The Water Cure effectual—Unreasonable conduct of many patients—The apology for them—Hope regarding the utility of this treatise—Want of other kind of arrangement of Hydropathic Establishments.

I have now presented to my non-professional reader, as much of the anatomy of the human body, as I deem necessary for the purpose of this volume; and which, I trust, will greatly facilitate his comprehension of the scientific basis of the Water Cure. In order

the more deeply to impress his mind on this interesting subject, I make a few additional observations on the connection of the three great eliminating functions, of which I have already treated separately; those of the skin, the lungs, and the liver. These are the three chief excretories of the body,—for ridding it of its superfluous carbon and hydrogen. Their united functions for this purpose, indicate the great necessity of avoiding any undue accumulation of these in the system. Nothing can be more perfect and beneficent in design, than is their combined operation, and under circumstances of derangement of any of them, we find that the others become vicarious, and compensative, for preserving the well-being of the animal economy.

The liver is usually regarded as a supplementary organ to the lungs and the skin, in this very important office; but with the notable difference, that the *non azotized* substances, (*without azote or nitrogen*) of which it relieves the blood, are used by it, as needful constituents of the bile, which it secretes for the purposes of digestion.

As said before, the particular office of the veins is to abstract and carry carbon from *transformed tissues*; and hence, the blood they contain, is usually termed, *carbonaceous blood*. That from which the liver abstracts carbon and hydrogen, is carried to it by the *vena portæ*, the large trunk formed by the union of innumerable veins, which ramify on, and return the venous blood from the digestive organs in the abdomen. That from which the carbon and hydrogen are abstracted in respiration, is carried to the lungs from the upper and lower parts of the body, by the *vena cava*.

In the diseased states of the lungs, the vicarious and compensative office of the liver is manifested. When they are suffering inflammatory action, and in asthma, also in pulmonary consumption, by which their air cells are diminished, or obliterated, their power of decarbonizing the blood is, in proportion, curtailed; and the office of the liver, in this respect, is found to be increased. A striking illustration of the vicarious operation of the liver, is afforded from the influence of tropical climates; and of the hot summer weather of our own. The atmospheric air becomes rarified, and in a given bulk, contains a smaller quantity of oxygen, in proportion to its high temperature; and thus its decarbonizing power is diminished. The deficiency of the eliminating function of respiration, in tropical climates, becomes tenfold in degree, through the too frequent folly of Englishmen, who indulge in most improper diet, large in quantity, and highly *carbonized* in quality, whilst living in inactive, and luxurious habits in India. The climate of the frigid zone, and the most active exercise of body, could alone meet such an emergency, to ward off the evil consequences of accumulated carbon, and other noxious elements of disease. The great work, however, is thrown on the office of the liver, under the circumstances, and much more than it can accomplish; hence its functional derangement; and soon succeed to this, the enlargement and disorganization of its structure; with all the consequences, in the various diseased conditions of the body and mind: all at length a wreck, and life embittered, if death do not close the scene and sufferings. Often by the falacious aid of calomel, and such means, the unequal struggle may be kept up for years;

these internal stimulants do certainly afford the needed and temporary relief ; but it is only temporary. " It is equivalent to borrowing cash at ruinous cent, per cent, if you like, enabling the spendthrift debtor to go on for a time blindly squandering ; but "pulling him up" so effectually in the long run, that he can neither borrow nor squander." Again, continues Dr. Wilson, " I do not then wonder at the attacks of diarrhoea, dysentery, cholera, and yellow fever, the four biliary plagues of hot climates, and which I now perceive, to be the explosion of pent up materials of disease ; materials which it would seem, patients voluntarily, carefully, presoeveringly, resolutely and as if of set purpose, accumulate ! Would that men would look upon diseases in the true light wherein you now represent them, as efforts of nature to rid the system of substances undrawn off by the outlets appointed to eliminate whatever is superfluous or injurious ; mischiefs entailed too, as you show, by paltry indulgences of the appetite, by childish dietetic excesses and irregularities."

The most efficient remedy is in the Water treatment, in such cases. Its means and appliances, for strengthening the tone and harmony of the three emunctory functions of the skin, the lungs, and the liver ;—also for correcting any less degree of derangement that may have taken place between them ; the most rational and hopeful means for curing their really curable diseases ; and for staying the progress of diseased action, and for alleviating the sufferings of that stage of disorganization, which is beyond the reach of any curative means.

The rigid regulation of diet, in quality and quantity, suitable to the case under treatment, answers the

necessary purpose of supply to the alimentary wants of the system, and the more healthful exercise of function of the digestive organs. The regulated exercise in open and pure air, gives to the respiratory apparatus the full power of decarbonizing the venous blood, and promotes the active circulation of that which is oxygenized and arterial, and by which the function of *transformation of tissue* is effected. The securing an active and healthy condition of the skin, on which so much depends, and through which, as a medium, we have so much command on the internal parts, is of the characteristic excellence of the Water Cure. This is accomplished by means of the various water processes ; the diet, regimen, and exercise, are the auxiliary, yet indispensable parts of the treatment.

I have repeatedly witnessed the very beneficial effects of the Water treatment on those who had undergone the injurious operation of Indian climate, and of their hurtful habits, whilst living there ; of which we have just been treating. When the patient had not proceeded to the extent of inducing structural disease of the liver, or other organs, but was suffering from functional disorder only, and sometimes of severe kind, the remedial and renovating efficacy of hydropathic treatment was very remarkable.

The overworking of the liver, alluded to above, in its vicarious and compensative operation for that of the lungs and skin, is often witnessed elsewhere than in tropical climates. In our own temperate climate of England, and in all seasons of it ; in the bracing cold of winter, as well as in the sultry summer, the same violence is done continually to the wisely arranged

organism of the human body; and in many other respects, besides that of overtaxing the one function of the liver: yet this is a frequent evil in action amongst us. The ruinous mode of overworking one organ for others in disuse, is the cause of much disease;—the evil ever attendant on civilization, and over culture of the mental, to the neglect of the physical constitution;—the state of human society in which passion and sensuality often play their parts uncontrolled:—the laws of health and organization are continually transgressed; but never without the infliction of the penalty, in proportion to the offence. True it is, that immediate suffering does not always, nor even usually follow at the instant, and to a perceptible degree: the account is current; and the seeds of future disease are being sown. At Hydropathic establishments are seen the various consequences of perverted functions of human organs; and beyond any comparison, is the system of treatment there, under proper and skilful superintendence, the most efficient and rational for cure, or for alleviation. This is constantly proved, in the many cases of this nature, which are presented for Water treatment;—in the unfailing beneficial results, when there is combined with it the faithful co-operation of the invalid: but in this matter, there is occasionally a failure; and it would be more just and true, to impute all want of success to this cause, than to any inefficiency of the system of treatment. I have taken notes on this point; and such is my decision. I have noticed the fault, or failing in many who resort to the Water Cure. They have frequently submitted, in comparative patience, to months, or perhaps years, of previous treatment at home, and by medicines of various

kinds, and, may be, of various physicians: yet they unreasonably require of the Water Cure, and with their own defective co-operation, an almost immediate riddance of their complaints. This I have witnessed and lamented: but we are not to wonder greatly, when we reflect on the collateral circumstances. It is to be regretted that at an earlier period, some exaggeration has been made, by certain writers, in their excessive laudation of Hydropathy; and the poor invalid is urged by suffering, and his great desire of relief, to credit too far, and to the letter of every thing advanced to allure him. We know how much we are all prone to believe what we *wish* to be true: and here lies the influence of the bait of every pretender. I do entertain the hope, that the perusal of this treatise, will enable the patient to find rational ground for encouragement, and perseverance, under treatment: and at the same time, without any for unreasonable expectations. Again, many of the Water patients are away from home, and from dear friends, and relations; and from their business, and at pecuniary charge, which becomes serious to those of limited means. As alluded to in a more advanced part of this volume, a great want exists, at the present time, for Hydropathic establishments on a different arrangement, in addition to those now in operation. Notwithstanding every set off, in consideration of this subject, there are continually the most convincing proofs of the efficacy and value of the Water treatment, in the cases we have alluded to.

CHAPTER XII.

GENERAL OBSERVATIONS ON THE ORGANIC AND
ANIMAL FUNCTIONS, AND THEIR CONNECTION WITH DISEASE,
AND THE WATER CURE.

Two distinct kinds of functions, organic and animal—ganglionic nervous centres—The distinguishing characteristics of each kind of nerves—The organic nerves also require due nutrition—Various kinds of disease from their derangement—Cancer, atrophy, and hypertrophy—The animal centres and their nerves dependant on them—The brain and spinal cord, the source of animal life, and of sensation, and the mental faculties—The excito-motory system of nerves—Spinal cord for locomotion and volition—The wise adaptation of the two kinds of functions—Sympathy between them—Organic irritability—The onset of disease—The change of tissue of the brain—The cause of insanity—Nervous complaints—The concern of mothers, and of literary men—Plato, and his disciples—All diseases from disorder of organic centres—Gout and Rheumatism—Erysipelas—Neuralgia—Exanthematous diseases—Hæmorrhoids—Consumption.

We request the attention of the reader to the few general physiological and pathological facts and observations presented in this chapter. They are in intimate connection with, and form, indeed, an essential part of the basis of the Water treatment of disease. His dispassionate consideration will convince him, that every method of treating the diseases of the human body, which is not in accordance with them, must be unworthy of our reliance; yet, this principal basis of all truly correct practice, is a discovery of comparatively recent times; and deeply is it to be regretted, that it has not, hitherto, secured that attention amongst many practitioners of medicine, which its great importance demands.

I am aware that there will be, in this chapter, some repetition of statements already made, in the foregoing parts of the treatise; or what may be readily inferred from them, by persons accustomed to the perusal of medical works. This is no cause of objection, in my opinion; my chief aim being to instruct the non-medical reader; and I am wishful to fix on his mind, the fundamental principles of the subject before us, and that he may correctly understand its real nature.

In the human body two sets of functions are performed through the instrumentality of nerves;—the *organic*, and the *animal functions*. Each of these has its own separate system of nerves, as already alluded to. They are distinct in their origin and distribution; but they are closely united in their reciprocal and harmonious actions, although distinct, and in some circumstances, strikingly different to each other. The *organic function* is that also of *vegetable life*. In the human body it is that of *individual, or intrinsic life and organization*. The nerves of *organic life* are without sensation or feeling, in a healthy state. They are also called *ganglionic nerves*, because of the ganglia, or knots (*γαγγλιον*) of nervous matter, which are seen in great numbers, especially in the neighbourhood of the central and vital organs. These ganglia are sources and elaborators of nervous power; and into these the nerves enter, and from them they proceed. They are in masses, and according to their position, they are named—the *visceral ganglia*—the *cardiac ganglia*—the *cranial*—the *thoracic*—the *lumbar*, and so on. They differ in size, as well as in position. They are also named—the *ganglionic nervous centres*. The organic nerves which proceed from them,

amify on every part and tissue of the body. Let my reader remember, that they pervade the animal nerves, which are dependant on them for their nutrition and existence. They constitute the means of every function, except those of animal life, sensation, and motion, and those of the brain : the means of digestion, assimilation, secretion, excretion, respiration, circulation, and calorification. Their great negative characteristic is, that they are without sensation or feeling ; and that they are not under the influence of the will, nor of consciousness. They never rest, and never sleep, whilst life lasts. The *organic ganglia* and *nerves* are themselves supplied with blood-vessels ; and, like all other structures of the body, they undergo the process of *change of tissue*. When this is defective, or perverted, they become of defective, or perverted function ; their irritability becomes morbid, and they acquire unnatural sensibility of any influences affecting them. Nutrition may be vitiated, defective, or excessive, because of the diseased state of the organic centres. From the first, may result *cancerous*, and other *malign disorganization* of parts ; from the second, *atrophy*, or *wasting* ; and from the third, *hypertrophy* or *enlargement* of certain organs ; as of the heart, and liver, and spleen. Because of the diseased state of the organic centres, and their nerves, there may be defect of the animal organs ; as of the brain, and spinal cord, from which the individual may die of nervous exhaustion ; which, in reality, is wrong, or insufficient nutrition ; as I have known in the cases of overwrought brains of literary men. Memory reverts painfully, to some instances of this kind, in which valuable lives were sacrificed at the shrine of ambition ; and in which, as

in many others, a sufficient knowledge of human physiology, and of the laws of organic and animal life, easily attained, would have tended greatly to avert much suffering; and humanly speaking, they might have escaped the premature grave.

“Has toties optata exegit gloria pœnas.” Juv.

The brain and spinal cord give origin to the nerves of *animal life*, by which its functions are performed; and they are for sensation or feeling. The brain is the organ of the mental and moral faculties of man. Nerves arising from the spinal cord, supply the power of locomotion, in obedience to the influence of the will: my reader must understand, however, that from it, other nerves also have their origin. It is composed of grey and white matter, and it is a continuation of certain parts of the brain. It consists of two lateral halves, which are constituted of separate columns. From its central part, which is called the *true spinal cord*, arise the *excito-motory system of nerves of the reflex function*, which is performed without sensation, and without consciousness, in the action of the hollow viscera, from the mere contact of their contents; as in deglutition or swallowing, from contact of the morsel with the gullet; —or of certain matters with the stomach, in vomiting; —also of the contents of the bowels and the bladder, to excite their wonted action. The minute anatomy and physiology of the spinal cord are extremely interesting. It may be considered as a distinct nervous apparatus, and as an intermediate and connecting link between the two great nervous systems of the organic and animal functions: for, it participates in the nature of both. The limits of this brief treatise do not admit of a more

minute description : and, indeed, I have hitherto treated of the nervous system in its more general division of two kinds, including this reflex function in that of the organic or ganglionic. It may be so considered ; although a more strict anatomy has established a further division of the spinal cord ; also of the different nerves arising from it, and even of their constituent fibres, for separate purposes. Their mode of origin, their combinations, and their actions, constitute a very striking and beautiful adaptation of means to the end designed for them.

Experience teaches us how great is the influence of the will over the power of locomotion, or exercise. We here see a physiological reason for it. The muscles have their power of action from the nerves of the spinal cord, and are suitably constructed for obeying the commands of the will. It is again noticed here, to inculcate the necessity of combining proper mental stimulus with exercise, in order to derive the benefit resulting from it. We know the great amount of bodily exercise and toil, which can be undergone, ~~not only~~ without distressing fatigue, but with ~~ease~~, and pleasure, and benefit to health, under the consentaneous stimulus of the mind ; as by sportsmen, and by pedestrians journeying amid fine scenery of mountain, and dale. The soldier, in the march of victory, and in that of defeat, is a well known illustration, positive and negative, of the principle. Let the Water patient ever provide himself with an additional object in his ambulations, if the precious one of obtaining health, and strength of limb, be not sufficient for the purpose.

This truly wondrous and beneficent arrangement of

the human frame, as seen in the adaptation of the two nervous systems, is worthy of infinite wisdom, and of divine goodness. To what purpose, but that of harm and suffering, would have been our consciousness of the action of organic life? Were we conscious of the beating of the heart, or of the action of the lungs, or of that of the stomach? To what purpose would it have been, that these functions were at all dependant on the will, as are those of animal life? Poor changeable, and sensual man would soon interfere with the working of his own internal mechanism, and with life itself. They are wisely, and beneficently placed beyond the bounds of our observation and control. Nevertheless, to a certain extent, and under certain circumstances, through the connecting branches of the two systems of nerves, the animal life becomes cognizant of what is passing in the organic. This is a pleasurable consciousness or feeling of bien-être or well-being, in health. But when there is danger from disease of these nerves, the warning is given to us by feeling, and pain, and the individual is roused to seek means of cure and escape.

The present subject has such a momentous bearing on the causation and connections of disease, also on the most rational mode of treatment, that we must examine further respecting it. It is, indeed, the foundation of correct pathology, and of correct and efficient practice.

It is one part of the office of organic nerves, to form a medium of communication between distant parts of the body, to associate their organic operations, and to preserve a mutual sympathy between them and the animal functions. This sympathetic action between the two systems, is ever kept in view for practical purposes

by the intelligent hydropathic physician. Man's excessive indulgence of his appetites and passions too often lays the foundation of chronic diseases, through its ill effects on the nerves of organic life. On these the first onset of disease is received, and by them it is communicated to other parts, and on their office, properly performed, depends the integrity of the structure, and the healthy condition of the animal organs. The action of the brain consumes its structure, as muscular exercise does that of the muscles; its *change of tissue* is hastened—its waste is hastened, and its fresh supply, through the agency of the organic nerves, becomes necessary. Thus the brain, and spinal cord, and their nerves may become diseased by derangement of the ganglionic apparatus, as noticed before. In this we recognize the frequent source of hypochondriasis, and of insanity of every shade and character. My memory readily supplies me with instances illustrating this influence of diseased nutritive function on the higher animal functions of the brain. Many examples of this kind, might be mentioned from the ranks of the great and the good, who have been on the earth. For neither rank, nor worth, can screen the transgressor of the laws of organic and animal life. It is my conviction, that derangement and disease of the nutritive function is a prolific source of human miseries, and of human failings, and errors, and crimes, much beyond usual calculation.

The influence of the organic on the animal system, is seen in the diseases to which the human body is liable; and the subject ever claims the special attention of the physician. The disorders of the brain and its nerves, the class of numerous complaints included in the term

nervous, in every degree of severity, from the slightest to the most intense malady, often have their cause in disease of distant parts, and especially of the nutritive centres, however induced. It has been my lot, to have some of the worst cases of the kind under my care ; and long before I had any knowledge of the Water Cure appliances, I had the most success in treating these disorders through the medium of the digestive organs ; and so far in accordance with the principle alluded to. It is my belief, that the medical superintendants of asylums for the insane, are withholding from their afflicted patients the most rational means of cure, or of alleviation, in foolishly keeping so far aloof from the Water Cure. In this world of ambitious struggle, and of anxious scramble for its riches and its honors, the brain, the organ of the mind, is necessarily, also, the part on which these primarily operate as morbid agents. Their influence however, is scarcely less direct on the organic centres : and seldom are they without the adjuncts of wrong diet, and wrong habits, which interfere with the digestive function. At all events, as already stated, the healthy structure of the brain, and of every other organ of the human body, depends on the healthy condition of the blood : this again, on that of the blood-making organs, and their organic nerves. It is a plain and patent truth, that without healthy structure there must always be the unhealthy function of an organ. No doubt, the specific character of nervous disorders is according to that of the structure ; but this is a complex point which we cannot hope to unravel correctly.

Reflection on the agency of the organic nerves, in the physical and mental and moral economy of man, leads

us to think, how greatly the subject concerns certain classes of society. Literary and professional men of sedentary habits, are especially liable to suffer from disregard, or ignorance, of the laws of organic and animal life ; and in the neglect of proper diet, air, and exercise. Those, also, who have to do with the nurture and education of the young, are greatly concerned in respect of their charge ; that they adopt proper means for establishing a permanently sound and healthy state of body, as the foundation of intellectual and moral power. How lamentable are the biographical records of many great and good men, in the eyes of one who has an adequate knowledge of the subject before us ! What error ! what sacrifice of talent, and time, and worth ! To literary men, and to ministers of the gospel, we would fain reach, in our earnest admonition on the fault of neglecting due means of bodily health, so entirely dependant on that of the digestive organs. In the words of Dr. Reynolds of Boston, U. S. "Sound health is necessary to the successful prosecution of literary pursuits. Disease throws a chain around the mind, which the latter, by its own unassisted endeavours, cannot burst assunder." Again, in graphic language, which I have too often seen verified to the letter—"Ill health is equally unfavourable in its effects on the heart. Piety is affected by the animal spirits ; and the spirits must and will flag, when the body is diseased. It is the medium of communication for the soul with outward things. When that medium is disordered, no object is presented in its true colours. Nature to such a man has lost its beauty. "The heavens are clothed in sack-cloth ; the earth is dressed in the garment of mourning." We daily see

instances of this melancholy fact. They speak too, from the grave. It stands forth in mournful prominence on the pages of many a diary that issues from the press; and doubtless on many more, which have not yet been presented to the public eye. We could almost weep while perusing these memoirs, to find faults in them which even the partiality of friends could not consistently with truth omit; but which we know, were the result of self-induced disease."

The philosophers of ancient Greece, and Plato, the mightiest of minds there, had more correct views, and wiser habits, than many of our modern literati, and christian ministers. He, and his disciples, gave due attention to the health of the body, whilst cultivating their minds: and great was his strength of thought, and soaring intellect. In that dark age of the world, his comprehensive soul could take a correct measurement of the real condition of the human race: and he could see, with an almost prophetic eye, the only remedy of its depravity—the necessity of the advent of a *supernatural being*, in order to the rescue. In his second *Alcibiades*, he introduces Socrates speaking of some divine teacher, of whom he was in expectation; and of the mist which is naturally upon the mind of man, which was to be removed by that teacher. "He is one, says Socrates, who has now a concern for us; He is a person who has a wonderful readiness and willingness to take away the mist from the mind of man, and to enable us to distinguish rightly between good and evil." The mind ever languishes with the body enfeebled by disease; but with the body in health and vigour, the soul of man can delight in putting forth its wondrous energy and

power, and can scan the heavens, and rise in its best and noblest aspirations in devotion to the infinite God.

On this subject of the organic system of nerves, we particularize further, and on the principle of pathology ever before the mental eye of the intelligent practitioner of the Water Cure—that all chronic diseases, the class usually presented for treatment, have their foundation in disorder of the digestive organs, which derive their functional power from the *organic nervous centres*. Our limits will not permit any lengthened account of these, in illustration; a brief allusion, therefore, to the chief ones, must suffice. Gout and Rheumatism have their foundation there; and the Water treatment succeeds so well against them, because of its efficacy in the removal of visceral irritation. Gout is produced by rich and irritating diet, with stimulating beverage; by which the blood becomes vitiated, of certain quality; and the stomach, and duodenum, and liver, become the seat of special irritation. The organic power makes effort to transfer this to the external and distant fibrous tissues; and this effort being successful, a paroxysm, or *fit of the gout* is said to occur: the extremities, and most frequently the joints of the feet, are attacked with most painful inflammation, and the disturbance of the digestive organs subsides. If the transference to the limbs be not effected, these organs continue in extreme disorder, and their great irritation extends to the brain and the heart; or these may be really implicated, in having the disease transferred to them. According to its local habitation in any of these organs, it is called, *gout of the stomach—of the brain—of the heart*, and constitutes a dangerous condition. Sometimes, however, and when

the organic power fails to transfer the visceral irritation, it is termed, *suppressed gout* : a less violent degree of disorder of the chief organs continues, and the patient is afflicted with extreme nervousness, and giddiness, and headaches of peculiar kind, with violent palpitation of the heart. We see the prominent operation of the organic power, in rescuing the vital organs, and in transferring the irritation to the hands or feet : we see also the original cause and seat of the malady, in irritation of the digestive organs, and vitiated blood. The subject is of great extent and interest, but we must leave it.

Next, and as nearly allied to gout, in many of its characteristics, we allude to Rheumatism, which has its seat in the digestive organs, also, with a morbid state of the blood ; and the fibrous tissues of the body are the particular textures of its attack, as they are of gout. They are both of hereditary nature—transferable from parents to offspring. Rheumatism is defined as a special inflammation of the fibrous coverings and sheaths of the muscles and joints ; and it owns, as its exciting cause, the application of cold and damp to the skin. Such application will only produce the disease, under certain conditions of the digestive organs, and of the fibrous tissues ; and these are frequently of a congenital nature. The stomach and liver are ever in an unhealthy condition ; and because of deficiency of organic energy in the fibrous tissues, the visceral irritation is readily received, and retained by them. Many patients, however, have these tissues in this susceptible state, from accidental circumstances—from hard labour, in the long and frequent use of them, as is the case with labouring men ; and who also keep up the visceral

derangement by wrong diet ; and this state of the digestive organs ever makes the skin more sensitive, and susceptible of the evil influence of external cold and damp. The operation of the usual remedies, in drug medication, against Rheumatism, affords strong proof of its pathological character ; as do those also, used against Gout. Again as in Gout, so also in Rheumatism, the heart and the brain, in their fibrous tissue, are liable, under wrong treatment, to be implicated in the disease ; and other complications are apt to occur from the same cause ; and from disregard or ignorance of the true nature of the malady, which is essentially of the internal nutritive organs. The Water Cure, skilfully applied, is, beyond all comparison, the most efficacious in Rheumatism ; and amongst patients of this kind have been some of the strongest proofs of its superior adaptation as a remedy. But of the rheumatic patients, who resort to the Water Cure, there are many whose previous long treatment by other means, makes them impatient and mistrustful ; and unless they be speedily relieved, they soon lose heart, without truly testing the real efficacy of that great system of cure. It may be safely asserted, in regard to this disease, of every complication and degree, that far more is attainable by the Water treatment, than by any other method ;—either for radical cure, or for extent of alleviation.

Erysipelas, or St. Anthony's fire, has, also, its foundation in irritation of the digestive organs, and that of particular kind. It is liable to change in its external and visible character, according to its degree of severity internally in the viscera.

Neuralgia (*νεῦρον αλγος*, nerve pain,) in its various

degrees and names, according to its locality, has its source and cause in irritation of the nutritive organs. It is termed *Tic-doloureux*, in the nerves of the face: it is *sciatica*, in the large nerve of the lower extremity, having its course near the hip-joint: and it is called *neuralgia*, when other nerves of other parts are affected. This painful disease has been often treated for other and different ones, until late years, when its nature has been more minutely investigated, and better understood. Some pathologists have connected it with the rheumatism, and have a *rheumatic neuralgia*. In the numerous cases that I have seen, and also seen treated, the most successful measures were always those which acted in accordance with the views herein stated, and were directed to the digestive organs. Some practitioners of experience suppose, that *sciatica* is more liable to result from disordered liver: that the *tic doloureux* is more frequently connected with irritation of the stomach; and that in females, it is more liable to extend to the scalp, and to cause severe headache. Any nerve of the body may be the seat of neuralgia; but it will be in connection with internal visceral irritation; and the treatment to avail for cure, must be directed against this. Neuralgia has various peculiarities, which will require the careful investigation and correct judgment of the physician; and, withal, the patience and perseverance of the patient. The pathological doctrine so ostensible in gout, and rheumatism, and erysipelas, applies in neuralgia. It is the organic power which repels the internal irritation to external parts: and in accordance with this, some trying circumstances are apt to occur in the course of treatment by water, of which

the patient should be forewarned, that he may not feel surprised and discouraged. At the commencement of it, and as an evidence of its favourable operation, the neuralgic pain is often augmented, for a time: the explanation is at hand—the action of the remedy is in the same direction as is that of nature's effort to remove the evil from the internal to the external and more distant parts: it assists the organs, by placing them in the most favorable state for their restorative action.

In addition to the preceding, and as an occurrence to be rather expected, is the disturbance of the stomach, by nausea and vomiting, with temporary feeling of discomfort, from the effective operation of the means. Neuralgia is often of an obstinate nature, being attended with the most inveterate visceral irritation, and requiring active treatment for its removal; and by which, considerable inconvenience, for the time, may be occasioned. It often happens, that the most marked relief is experienced from bilious discharge; also from purgation of the skin, and from its extensive eruptions. This disease is one of great interest, having various connections with different organs, but which cannot be treated of here, because of our narrow limits. Under the afflictive circumstances of a malady, which causes such intense, and frequently prolonged sufferings, the invalid has the strongest claim on our sympathy; and that he be encouraged to perseverance, whilst every earnest endeavor be made for his liberation. Much alleviation of pain, and total removal of it, have been often produced by medicines. Yet, the prospect of permanent cure is most reasonably to be entertained from the Water Cure.

In the instance of exanthematous complaints, as of

scarlet fever, and small pox, and measles, the pathological doctrines here stated, are confirmed. These disorders are communicated by infection; certain morbid matter is taken into the blood, and an eruption on the skin succeeds, in due time. They have each a distinct name, but the primary seat of them all, is in the internal digestive organs. Hence the constitutional disturbance, and fever, preceding. Hence also, the return of these, and with increased danger, if the eruption be repelled. The freedom from danger is in exact proportion to the power of the internal organs to transfer the eruption to the skin, and to keep it there. It is an interesting question, respecting the nature of the several specific poisons evidently making the exciting causes of these eruptive complaints, why the peculiar form of eruption, and the other distinguishing circumstances belonging to each? It is likely to remain a question unanswered.

The prescribed limits of this treatise will not permit us to specify much more concerning the connection between the diseases of the human body, and its disordered *organic centres*, as their original seat and cause. Further however, we make allusion to the distressing affection, *hemorrhoids* or *piles*. This is ever the consequence of obstructed circulation, and most frequently, of the liver. My reader is now prepared, by what has preceded, to know how this obstruction becomes the cause of piles. The venous blood, which ought to be carried from the large intestines to the vena portæ, and by it to the liver, not finding ready passage, congests on the lining membrane of the rectum. An inflamed state of this membrane is the consequence, and causes, what are

called, *internal* or *blind piles*. Sometimes, this inflammation forms a fleshy substance. Again, often the veins of this membrane of the rectum are in an enlarged or congested state, so as to protrude from the anus, and are very painful, and bleed to a great extent. This state is the *external* or *bleeding piles*. This disease is frequently treated at Hydropathic establishments; and the Water treatment is decidedly the best, and removes it when other, and various methods, have failed. The cure is effected by the removal of the cause; by liberating the digestive organs, and especially the liver, of its surcharge of blood. True it is, that hæmorrhoids frequently accompany organic disease of the heart, and of the lungs, as in consumption, and asthma: yet there is with these, congestion of the liver. Individuals most liable to piles are the sedentary and studious; also those who indulge in improper diet, under such habits of inactivity. The use of much fat, and of alcoholic liquors, conduce to piles; because they overwork and congest the liver. Hæmorrhoids are but symptomatic of other complaints, as are also dropsy and jaundice; and they are the effects of the original cause of all other diseases, *the diseased condition of the organic centres and their nerves*.

It would be an interesting, and not a difficult undertaking, to trace the connection, as cause and effect, between diseases, and the condition of the organs of nutrition. The want of a precise apprehension of this pathological doctrine must necessarily lead a medical practitioner into erroneous modes of treatment. This will be evident in regard to the different affections of the lungs. In asthma, and consumption, and in bronchitis: yet, it applies not less to others. However, of these we

will select pulmonary consumption, and say a few words respecting it,—the great destroyer of so many of an interesting portion of our population of Great Britain. It is acknowledged to depend on vitiated blood. At the present time, it is a disputed question, whether it be within reach of any remedial mode of treatment? whether it be really curable? much has been published on the subject, and data, from the highest medical authorities, have been brought forward in support of the affirmative,—that pulmonary consumption is curable, and not only in its incipient, but also in its more advanced stages. A much greater number of the profession, however, and of highly competent practitioners, deny the possibility of any radical cure of the disease, when once set up in the lungs, in its genuine *tubercular character*.

Perhaps, it is more an inference drawn from each one's so frequent experience of the fatality of Phthisis in his hands, than any correct conclusion, based on physiological and pathological reasons, that tubercular disease of the lungs is said to be necessarily incurable: and it is not unreasonable to hope, that its great fatality may yet be much diminished. The French physicians have been more successful, and more confident, in the treatment of this disease, than those of our own country; and I am disposed to impute that success to the fact of their treatment being more exclusively hygienic. It remains a strong impression on my mind, that any treatment, to be really effectual, must be of this nature: and foremost in the rank of remedies, must stand the Water Cure, skilfully and prudently practised. It must be directed to the great and twofold purpose, and for which it is eminently

adapted,—of raising the tone and power of the organs of blood-making and nutrition, for the formation of healthy blood and sound structure;—and exciting the general absorbent and excretory organs, for the elimination of that blood, and that structure, which are morbid, and of tubercular nature. There are different authors who advocate the curability of tubercular consumption; and striking data, with powerful arguments, have been advanced by those, especially, who inculcate hygienic, or hydropathic treatment. Without a full assent to the correctness of their doctrines on the formation of tubercles, and the mode of their removal, I do believe, that what can be done for this interesting class of invalids, is most reasonably to be expected from Water Cure measures. This I state on the ground already specified—of the proximate cause of the disease; and the evident indications of cure, by such means as are especially provided in Hydropathy. With this in view, I can give ready assent to the statement of M. Rogée, published in the *Archiv. Gen. de Med.* 1839. P. 475.

“Si je ne me fais pas illusion, on arrivera un jour à sauver *beaucoup* d’individus atteints de tubercules pulmonaires. Il faut, pour parvenir à cette conquête médicale, poser sur des bases solides la question du traitement; presque tout est à faire encore dans ce but **** il ne faut pas désespérer aussi facilement qu’on le fait de guérir les malades qui portent des tubercules dans leur poumons; qu’il est de toute nécessité d’user *au plus tôt* des moyens qui paraissent avoir quelques chances de succès, tels que les voyages, les distractions, la soustraction de toutes les causes d’épuisement physique ou moral, etc; on ne manquera pas de réussir quelquefois, puisque les cas de

guérison observés jusqu'ici *paraissent dus, en général, aux seuls efforts de la nature.*"

I also readily concur in the sentiment of Prof. Forget, another French writer on this subject, and referred to by those of this country—as is also the author just quoted.

"Est ce a dire qu'il faille abandonner les pauvres phthisiques aux ravages de la maladie ? Non, sans doute; et l'on vient de voir, par les observations ci-dessus, que nous sommes en droit d'espérer d'assez heureux resultats. La médecine qui soulage, qui calme les douleurs, et qui retarde la mort, est peut-être aussi fréquemment utile que celle qui guérit; elle suffit à la gloire de l'art, et doit suffire à l'ambition de l'artiste."

Pulmonary Consumption arises from that depraved state of the vital fluid, from which the primary seeds of tubercles are formed; and this leads us to the original cause, in the morbid state of the organic centres, from which the blood-making organs receive their power. On the plain principle of physiology and pathology, so often referred to by us, on the nutrition of textures, it cannot be disputed, that many cases have been arrested, as affirmed by authors on the subject. Whatever have been the ostensible remedies made use of, the efficiency of the treatment of this fell destroyer, must be in its effects on the organs of blood-making and nutrition.

Certain attention will, no doubt, be requisite, also, towards the lungs themselves; that they be placed in favorable relation to external influences; but the grand object before the eye of the mind, must ever be—in the improved state of the blood; and for this, there must be the healthy condition of the central organs, and of the organic function of *supply and waste* of the frame. Of all

methods of treatment, ever propounded for alleviation, or radical cure, the most rational in its adaptation to the end in view, is the Water Cure. The great question in each case will be, as to the amount of the tubercular matter already deposited in the texture of the lungs, and the degree of impregnation of the blood : and above all, the constitutional stamina, the *vis organica*, the *organic power*, to secure the removal of the one, and the depuration of the other, by the appliances and means of our science. It is not to be concealed, withal, that many are the conditions and circumstances to be secured for the purpose of success ; and that those of an opposite tendency are often in operation against it. However, the usual method of treatment of this disease by drugs, and removal to warmer climates, is erroneous in principle, and it is the erroneous treatment of effects instead of causes.

In association with the subject, I have a vivid recollection of the Phthisical case of an excellent individual, the Revd. James Watson, who underwent the Water treatment at Grasmere, in Cumberland, under the care of Dr. Paisley, not longer than six weeks, in 1847.—It was the extraordinary and beneficial result of that short treatment, after the failure of all other means, which fixed my attention, and led me to a minute investigation of the Water Cure. In the interesting case of my valued friend, the most untoward circumstances caused an interruption of the Water treatment, and prevented his resuming it ; otherwise, as it remains a firm impression on my mind, he would have been ultimately cured, and the world would have retained one of the best of its sojourners, a man of powerful intellect, and of genuine christian excellence.

PART II.

THE WATER CURE

And its means and appliances.

CHAPTER I.

GENERAL OBSERVATIONS ON THE NATURE OF THE WATER CURE, AND ITS MODE OF ACTION.

Hippocrates and other authors have held the doctrine of the *power of nature* in the cure of disease—In water treatment, the great point in view—This *organic power* not correctly apprehended—Its definition—The means and appliances of the Water Cure for the *change of tissue*—The mode of its performance—The negative means of treatment—Effects of alcohol—Use of drugs in the water treatment—Treatment out of establishments—Mental influence of a physician's care—The Water Cure is nature's way—Homœopathy and mesmerism—Opponents—Action of means—All diseased action from morbid state of nutritive nerves—Broussais and Andral—Different conditions from states of nutritive nerves—The blood in capillary vessels—State of digestive organs, and its influence—From nervous deposits, various changes—Quotation from Gully—The skin the best medium—The duty of the physician—The patient warned—Operation of means on the animal system—Crisis—The Colon, and its office—Maldistribution of blood—Deficiency of it, and Gully's remarks—Chemical agency of the Water Cure—Liebig's account—Principal objects of water treatment.

In the writings of Hippocrates, and in those of the ablest authors on medicine since his time, the *power of nature*, the *inuate vital power* of the human body, is held to be the agent in the cure of its diseases. And whatever remedial means may be employed, they are only effective of good, in their action as *adjuvants*, or aids, of that power. This fundamental doctrine of the healing art is properly inculcated by its best writers and teachers of the present day ; yet it might be thought to have but little connection with allopathic practice, from its very numerous medicinal remedies, and their elaborate classification, according to their *supposed* effects on the human body. Nevertheless, the doctrine is correct, and of essential import in its bearing on the success of treatment, by any method or means whatever. The mental eye of the hydropathic physician is ever fixed on it, as the one chief principle of his practice. It is ever taken account of, in his investigation of morbid changes, and in his diagnosis of disease. With it ever in view, he regulates the application of the water processes and judges of the progress of cure.

Although already so repeatedly alluded to in this treatise, the non-medical reader may not possess sufficiently distinct ideas respecting *this curative power of nature*—the *vis medicatrix nature*; of Cullen ; the *organic vitality*, in reality. I am wishful that he have a correct apprehension of it, in order to duly appreciate, and more fully understand the nature of the water cure : that it is really based on physiological truth ; that all curable diseases will be most safely and effectually cured under its treatment, provided ever, there be no lack of skill in the professional adviser, and no lack

of faithful co-operation on the part of the patient. This *vis medicatrix nature*, then, is *organic vitality*, and exists in all organized bodies, vegetable and animal. It exists in the seeds of plants, and under suitable circumstances, has resisted the influence of external agents, and has preserved them to vegetate and grow, in the beauty and luxuriance of nature, after thousands of years. It heals the wounds made in the bark of trees; and on it depend the various operations of the gardener, and the florist. It is also in the egg, and constitutes its power for the future production of the soaring eagle, or the nightingale, the songster of the grove. In man, it is the first to live, and the last to die. It exists in the embryo, and is productive of the first sign of life in the small pulsating spot of the organized substance, the foetal heart. In the *fœtus in utero*, it is as perfect as at any other period of existence; whilst the manifestations of *animal life* commence at birth, and its functions require exercise for their development, and a period of time till adult age, for their perfect performance;—the brain for the mental faculties, and the muscles for voluntary motion. It constitutes the *irritability of organic nerves*, as *sensibility* is the distinguishing attribute of *animal nerves*. It is in every part of the body, but it has its central seat in the *organic nervous centres* of the internal viscera; whilst the central seat of *sensibility* or *sensation* is in the brain and spinal cord.

The cause of health, and of disease, have their primary action on the *organic irritability* of structure. Those of health are, proper food, atmospheric air, light, and electricity, exercise of the body through the stimulus

of volition, and the proper exercise of the other mental faculties; also the action of water as a beverage, in aiding the vital chemistry of the system.

Such are the natural causes of health, and which operate without fail, in preserving it, when not interfered with through the ignorance and folly of man. Such are they, the hygienic agents of nature, which preserve the health of body and mind, through life. In the Water Cure, the same agents are adopted against the diseases of the human frame. Yet, the scientific physician, who really understands its physiological and pathological laws, ever places his chief reliance on the agency of its *organic restorative power*, and ever aims to place the organs under the most favorable circumstances for its effective operation. These means are, in the regulation of diet for the digestive organs; and of air and exercise for respiration, and circulation; and the internal and external application of water. The combination of these means and appliances is to secure the healthy nutrition of the animal frame, effected through the capillary blood-vessels—the waste and supply of its various textures. In this important process, so frequently referred to, we know of the action of oxygen, in its combination with the carbon and hydrogen of the waste, to form carbonic acid and water, which are carried, by the venous capillaries, to the larger veins, and by these to the lungs, for final elimination. Beyond these operations, we must admit, also, that of *electricity*, although we cannot define the extent of its influence, nor the exact mode in which it is exercised. We may, however, admit of that power, which co-operates in all the physical processes of our globe. It is supposable, that in the internal and ex-

ternal use of Water, some favorable change is produced in the electrical condition of the nerves : or, according to the hypothesis of some intelligent writers, the alteration may be more in the electric affinities and relations of the blood globules.

The first and essential step to be taken in the Water treatment, is of a negative character ; and consists in the withdrawal from the patient, of all unfavorable influences, and which have had to do in the causation of his disease. This is an absolute condition of treatment, without which, it would be folly to undertake it. As often written, the habits of civilized society are usually productive of disease ; and especially so is the use of improper diet, both as to the quantity and quality of food. By far the most prolific cause of disease in this country, is excess in eating ; and the use of intoxicating beverage. Far short of that excess, which constitutes the destructive and monstrous habit of drunkenness, is what is usually termed,—the temperate use of stimulants in wine and spirituous liquors. This is the less prominent evil, but it is one of dire influence on the health and lives of thousands, who entertain delusive ideas of its utility. We will here say a few words respecting it. The evil effects of spirit drinking, or of intoxicating beverage, of which alcohol is a constituent, are not sufficiently known. These are, by no means, confined to the harmful stimulation of the brain and nerves, and of the mucous membranes, with which it comes in contact : the inevitable effects, in the deterioration of the entire tissues of the body, must be also put to the account of evils. Alcohol consists of three parts of hydrogen, and of two of carbon, and of

one of oxygen, according to Liebig's analysis. We thus see in its composition, five parts out of six, which, when introduced into the system, go to rob its blood of the oxygen ever required to preserve that system's integrity of structure. No wonder, that nutrition becomes imperfect; and that the liver, and kidneys, and the lungs, and the skin, are deranged in their functions; and that the waste and noxious matters of the body find not their proper outlets, because of the constituents of alcohol, which combine with that oxygen, intended to unite with them, for their elimination. It is readily accounted for, why such individuals possess unhealthy blood, and unhealthy tissues, and have so little power to resist the influence of morbid agents. No wonder, that with blood so deficient in vivifying oxygen, and so replete with qualities of opposite nature, such persons are without energy; and their brain, being so supplied, that they suffer from lowness of spirits, excepting at the times when they are under the stimulus of alcohol. The degree of injury in this way, will be, of course, according to their habits, in other respects. Those who are much out in mountain air, will experience the less amount of injury; and those who are cribbed and confined, will the sooner find the premature grave. But to be brief, and to revert to our point of needful withdrawal of hurtful influences: there is the very best arrangement, for this purpose, already provided for the patient, at Hydropathic Establishments, presided over by intelligent physicians; and they afford advantages for the restoration of health, which cannot be procured elsewhere. I write advisedly on this subject, and after abundant opportunity for forming a correct judgment.

We may here notice, that some controversy has taken place respecting the use of medicines, in combination with Water Cure measures. Mild aperients are occasionally administered, as auxiliary, in urgent cases : and I have repeatedly prescribed them, under such circumstances, with satisfactory result : yet, as a general rule, all medicines, *as necessary means of treatment*, are repudiated at hydropathic establishments. We must except those, however, at which Homœopathy is practised, as a collateral means, by some physicians ; but, in their opinion, only second to the Water Cure itself.

During my three years at Malvern, I had a gratuitous practice amongst the poorer classes of the neighbourhood, which afforded me a very favorable opportunity for testing the combination of drug practice and hydropathy. The people there, are necessarily familiar with the latter, and are entirely free of the prejudice and fear of it, which may be expected in those at a distance. I had many excellent cases, and amongst them, many proofs of the great advantage in the union of the two methods, where circumstances prevent the adoption of the exclusive Water treatment—usually the best. More particularly did I prove the efficacy of the Wet Sheet packing in fever; and in rheumatism, also, conjoined with the compresses, and the Lamp Bath, and other processes, as needed. I had abundant proof of the power of properly regulated Sitz Baths, in disorders of females. Indeed I tested the combination of the two systems so completely, that I am quite convinced of its great utility amongst general practitioners of medicine, who may possess the wisdom and resolution to adopt it.

That the digestive organs may be placed in the best

circumstances for the exercise of their self-restorative power, in the cure of disease, all irritation from improper diet is to be carefully avoided: also, all causes that can operate unfavorably through the medium of the mind: These points, of proper food, and of mental rest from care and toil, have much bearing on the progress to be made in recovery, and are most readily secured at Hydropathic Establishments: no physician there, however, who values his reputation, will risk it in professional undertaking with any patient, on whom he cannot rely for faithful co-operation.

Notwithstanding my conviction of the great advantages enjoyed at those establishments, and that they may be managed to possess an instrumentality for the highest purposes of usefulness, I am also persuaded, that the Water treatment may be effectually carried out away from them. Further, that there are particular cases, and such I have seen, for which they are not fully adapted. Let my reader remember, however, that actual disease, of any degree of severity, can never be properly treated by water, without the personal superintendence of an experienced hydropathic practitioner. In no case will the cure be regularly progressive, and ultimately complete, without it. But other consequences than mere failure of cure, may result from self-treatment by water: as in any other mode of treatment, the patient may inflict positive injury on himself. I would insist more emphatically on the necessity of professional and competent superintendence, in order to secure the efficacy and safety which belong to the Water Cure properly administered; for, occasionally, such failure, and such consequences have been attributed to the nature

of the system itself, and have been published as such by its ready opponents. We need not argue, however, on the unreasonableness of such conclusions, and the unfairness of such opposition.

In addition to the direct advantages of the experience and skill of the professional man, there is an amount of mental influence on the patient, which cannot be overrated in its importance and beneficial bearing on the final result of treatment: this consists in his having the physician's directions and advice, to follow—his authority, to submit to—his skill, to rely on—his honest and cheering encouragement, to hope from—and his sincere sympathy, to sooth him. Every intelligent patient needs but short reflection, to know well the truth of this statement. I make it from much that I have known of positive and negative evidence of its correctness.

The reader is already aware, that the means of the Water treatment are only more intense in degree, than those of nature; and in other respects, identical. With diet, air, exercise, and water, the human organism is assisted in its own efforts, and by the same means, against disease, which it makes use of for the preservation of health. We do occasionally resort to additional, and auxiliary measures, when urgent circumstances require: occasionally, we administer mild medicines, as noticed above: and as the predilection of the physician may be, aid is also sought occasionally, from other systems of treatment;—sometimes from homœopathy, whilst another may seek it more confidently from mesmerism. In almost unavoidable association with the mere names of these methods, is the very blamable severity with which their advocates have been assailed by a certain

grade of *soi disant* regular practitioners, who are not ashamed to publish unworthy epithets, and to attribute unworthy motives to others than themselves. One has shame in noticing the subject, but it comes in our way, and with very few words, we will pass it. The hydropathic physician, who is worthy of the name, loves scientific truth for its own sake ; and thus actuated, he will not budge from his path, because of being sneered at by those who are in total ignorance of his science ; and who are usually actuated by the unworthy motives, which they attribute to him.

To return from this brief, and unpleasant digressson. In the identity of the means and appliances of the Water Cure, and those of nature, there is good ground for the assurance, that the cure is more likely to be permanent, than is that brought about by other modes, and of opposite tendency.

“ Nunquam aliud Natura, aliud Sapientia dicit.” Juv. By the internal and external application of water, with the exercise enjoined, the digestion of proper food is promoted. All the water processes tend to draw the blood from the internal, and surcharged organs, to the skin ; and to reduce the morbid irritation within. Again, the active occupation of every day, tends to promote the circulation of the blood, and to improve its quality : the water drinking, and the exercise in the mountain air, favor greatly the chemico-vital operations on it, and it is thereby continually undergoing change, and for that of the previously impure, is substituted a better kind, and one calculated to effect a more healthy nutrition of the whole body, whose functions are now discharged with more vigor, and regularity, and perfection. The more

intense degree of natural stimulation, is of a different tendency, to that of other stimulants, and is found, with incalculable benefit, to supersede them all. Hence it is, that we so constantly witness the rescue of patients from habitual, and noxious stimulation, through the substitution of the natural one of the Water treatment, which is that of health.

It is now understood by my reader, from what has preceded, that no organ of the body can be really diseased, apart from the morbid action of the nutritive nerves belonging to it. This is taught by the first physiologists of this country, and by those of the continental colleges.* In the valuable writings of Bronssais, and more lately, of Andral, each in their day, *nulli secundus*, second to no other, in physiological and pathological knowledge, this doctrine is illustrated. Under a due degree of stimulation, these nerves exhibit the *healthy life* of the organ, or part of the body. An increased degree of it produces the manifestation of *excessive life*; and as a consequence, we have afterwards *diminished life* in accordance with the law, that exhaustion ever succeeds extreme action. When there is diminished nutritive nervous energy supplied to the blood-vessels, their power of circulation, in their capillary ramifications, will be necessarily diminished; and these capillaries will be distended with their contained blood. This is the condition of arterial capillaries in inflammation; as in that of the eye, in its *conjunctive membrane*, the white of the eye, commonly so called: this condition of distended capillaries in inflammation, and in chronic congestion of organs, has, in inseparable connexion with it, another and opposite state of the other organs, which

most readily sympathize with them : whilst the former have an excess of blood, the consequence of deficient organic energy to pass it forward, the latter have a deficiency of it, and consequently also of their secreting function. This is seen in the usual attendant circumstances of inflammatory action ; and in the chronic congestion of the upper organs of digestion, so constantly accompanied with defective action of the skin, of the kidneys, and of the colon ; also of the membrane lining the mouth and fauces, and causing dryness and thirst ; as the other defective states are indicated by a dry and pale skin, and scanty urine, and constipation. Again, the reader will remember, that all the organs of the body are united by an intimate sympathy ; and that no one of them can suffer irritation in itself, without affecting those especially in most direct connection with it. All parts are connected through the ganglionic or nutritive nerves ; and the great central portion of them is in the viscera concerned in digestion ; thus we learn, how the stomach becomes so readily affected by injury and irritation of other parts ; and on its condition will depend that of those parts, when under the influence of injurious causes. That the result of disease or violence, suffered by distant parts, will depend on the effect thereby produced on the stomach ; and this will be according to its state at the time. This has full illustration in the case of wounds, and of surgical operations.

Often have I seen the merest scratch, or smallest puncture, suffice to cause the most severe disturbance of the whole system, and even eventually to destroy life, in the gormand and drunkard, of depraved habit of body, and especially of depraved state of the digestive

organs ; whilst the most severe contusions and wounds, in the temperate, hale, and healthy man, have been rapidly recovered from. In the surgical wards of our hospitals, the condition of the digestive organs is properly looked to, in the treatment of cases ; and in preparation for capital operations. Also, in the occurrence of common colds, those of sound state of the stomach and bowels, seldom take them ; whilst the dyspeptic is particularly liable, and usually suffers long and severely.

Of the various deposits from impure blood, we must recollect that which consists of nervous matter ; in other words, depraved nutrition of nerves ; and the various indescribable feelings which have their origin because of this. In addition to the depraved quality of the nervous material, there may be also an excess in its quantity ; and hence we have excessive sensibility. The invalid feels that he has a stomach, and is sometimes painfully cognizant of every stage of his depraved digestion. More than this, he may have a voracious appetite, whilst the stomach is full of food. Thus too, we account for his capricious taste. And he may have the sense of smell also depraved, so that he may taste, and smell, when there is no cause or object, beyond the morbid condition of the respective nerves of the organs. What is said of the organic nerves connected with digestion, applies also to those of other parts. We thus explain the capricious taste of the lungs, so to speak, for their natural food, the atmospheric air. We see it in the asthmatic invalid. *One* does best with the light mountain air ; whilst *another* can only breath with comfort, when living amid the smoke and fog of the city. As noticed above, the only scientific system of treatment of the

diseases of the lungs, is that which has special regard to the digestive and blood-making organs. We apply the same principle to the treatment of every chronic disease of the human frame. On this principle, the Water Cure effects so much, after other modes of treatment have failed. Whilst the digestive organs are discharging their function in health and vigor, furnishing good blood for the wants of the system, that system is proof against chronic disease: and this power, for prevention, or for cure of disease, is in the *organic nervous system*. "It is upon the organic power enjoyed by every blood-vessel in the body, a power represented by the *ganglionic nervous system*, and having its centre in the viscera, that the Water Cure operates; and it is by it, that the Water Cure produces its results. It is by the liberation of this power from oppression, and the restoration of its energy, that the Water Cure rouses in it those salutary efforts which constitute the *only* means of obtaining *permanent* cure." (Gully.)

The skin is the field of the remedial operation of the Water Cure. The consideration of its structure, and offices, and of the position it holds in relation to the organs of the body, decide on its selection, as the best for the purpose. It is in connection with the two systems of nerves, through its abundant supply from each of them: hence its ready sympathy with both classes of organs, those of the organic, so often alluded to, and those of the animal system,—the brain and spinal cord. We find that the condition of the skin is greatly affected by the more powerful emotions of the mind. We see it in the violent excitement of rage, as well as in that of excessive joy. We also see it in the opposite

ternal parts ; these are also made to react, by the same means, and to repel their blood to the surface. Without proper regard to the relative condition of the internal and external parts, the opposite results might be produced : the internal congestion might be increased, and the organic power of the skin further reduced. Contrary to the erroneous notions of the opponents of the Water Cure, its resources are more various, and more within our power of regulation ; and their modified operation more to be depended on, than are those of any other *modus medendi* whatever. In the hands of the uninitiated in its fundamental principles of physiology and pathology, it is, no doubt, a haphazard method of treatment, which may be of benefit, or of harm : the same is equally true of all other systems of treatment.

We have here treated chiefly of the influence of the Water treatment on the *organic system of nerves*, through the medium of the skin ; and through the organic centres, and the viscera, on the whole frame. We must also keep in view, its influence on the brain and spinal cord ; and through these, also on the viscera. This, the latter mode of operation, is more marked in the more stimulating water processes ; as the douche, and the lamp bath : in a less degree, also, we can see this in the action of the rubbing sheet, and of the foot bath. Their effect is manifest in the removal of headache of nervous kind : often, also, this mode of action is observed in the production of nervous disturbance, and of wakefulness, and of general irritation of the mind ; and so much so, as to necessitate a temporary abstinence from bathing. This state of nervous irritation is sometimes a precursor of a *crisis*, and is indicated by the patient's

great dislike, and even dread, of the baths. It is a phase of circumstances which requires the judicious superintendence of the physician, to bring things thus placed, to a favorable termination. Besides this excitement of the brain and spinal cord, by the action of certain processes, there is markedly, also, a very soothing influence on them, by that of others; particularly by that of the wet sheet packing, which far excels all other known agents, in its power over cerebral and nervous irritation, and in inducing sleep of most soothing, and restorative nature. As a soothing process of the Water Cure, on the brain and spinal cord, we may specify *hot and warm fomentation*: also, of this kind of action is the properly regulated *sitz bath*. But of the processes more fully, when we come to treat of them separately. It remains however, to be stated, that the soothing operation is not exclusively on the brain and spinal cord, but also on the *organic nerves* of the skin; and in this way, more directly on the internal organs. By the repetition of the operations, at proper intervals, with strict attention to the other parts of treatment, the effect is rendered permanent, and the ultimate object of perfect recovery is attained: and this, too, is permanent, because it has been effected by the *vis insita*, the *innate self—restorative power of the organs*, which is now liberated from oppression.

The combined influence of the water processes, and their repetition, usually three times a day, with that of regulated diet, and exercise, are practised in aid of the *organic power*; and for restoring the equal circulation of the blood; also for its depuration, when impure; and for its further formation, when of deficient quantity.

The means adopted, tend, in their operation, to the derivation of the blood from the internal to the external parts, and the skin; and hence we have occasionally, excessive action there. This is seen in eruptions, and boils. The circumstance was supposed, during the early period of the Water Cure practice, to be a certain earnest of recovery; and indeed, a requisite condition of it: a kind of ocular demonstration of the elimination of the *materies morbi*, the constituent material of the disease: the *bad stuff* of Grœfenberg. This, however, is an untenable doctrine, when applied as the entire explanation of the action on the skin, and gives an erroneous and contracted notion of the nature of disease, and of the *modus operandi* of the Water Cure. The fact of boils, or of eruption, on the surface, simply implies, that there is, at the time, an overaction on the skin, and certainly shows the derivation of blood towards it, whether it be of good, or of bad quality: no doubt, there are frequent instances of depraved condition of the blood, in which there is, in these boils and eruptions, an actual transference of morbid matter. It is usually the effect of more stimulating treatment, as was the case at Grœfenberg. Let my reader remember, that this *crisis of boils*, as termed by many, is neither requisite for recovery, nor even desirable in some conditions of the system; a more carefully conducted treatment by water will often lead to a perfect cure without it. Still, under the most careful management, they do frequently make their appearance; which shows the greater degree of visceral irritation, rather than the impure quality of the blood. There are also other actions, the effects of treatment by water, which may be more properly considered

as *critical*; and, at all events, they are of salutary nature. I allude to the action of internal organs, when relieved of the excessive quantity of blood, which had obstructed their functions. On obtaining their release, they recover, also, their power of secretion; and begin to pour out their respective fluids: these fluids are often, at the first, of morbid quality; but soon become healthy. It is on this principle, that the stomach recommences its proper secretion of mucus on its lining membrane; and that of the tongue, which is a continuation of it, changes from a dry, to a moist state. So also, the liver recommences the secretion of bile, which is more frequently, at first, of more acrid kind, and formed in such excess, that the stomach is excited to vomiting; and we have a *crisis of nausea, and bilious vomiting*. After a while, these secretions are restored to their proper nature. There is a *critical diarrhœa*, which frequently indicates an improvement in the distribution of blood. In connection with this, is the point of physiology, usually unknown to non-medical readers, and not sufficiently considered by many medical practitioners: we made mention of it before, in our anatomical description of the intestines. The colon, the first of the large intestines, is of great capacity and extent, and holds an important office in the system. From the mucous membrane of its internal surface, is secreted a great part of the more liquid fœces, from the blood circulating in it; and as all other functions of the body, this is performed through the power of the organic nerves. It is plain, that whatever may deprive the colon of its due quantity of blood, will also operate as a cause of constipation. Irritation, and congestion of blood in

other parts, operate in this way. Hence the habitual constipation of the careworn and dyspeptic, in whom the brain and spinal cord, and the upper organs of digestion,—the stomach, duodenum, and liver, are under irritation and congestion, through the morbid state of the ganglionic nerves belonging to them. In the case of *critical diarrhœa* alluded to, the appropriate treatment of the irritated and congested viscera having availed, the colon is enabled to resume its action, and their excess of blood, hitherto retained by them, is now restored to it, and diarrhoea is the *critical* result of their relief.

In this chapter, respecting the mode of action of the water treatment, we have hitherto been chiefly occupied with what concerns the organic and animal systems of nerves; and the agency of each, in connection with disease; and of their influence, aided by natural means, in its cure. The causes of chronic disease, in their primary operation, cause the mal-distribution of the blood, through the medium of the disordered organic nerves. We have shown, that in the external appliances to the surface, we possess the most effectual remedy: that it is in the derivation from the internal to the external parts. That the restoration of energy to the functions of the skin, is the most efficient step towards health.

The deterioration of the blood must necessarily result from its unequal distribution and congestion on the blood-making organs. Its quality will be deteriorated in proportion to the previous length of time that digestion and nutrition have been interfered with. Plainly, my reader will perceive, that from morbid blood, must be formed morbid structure; and the circulation of blood,

with every other function, must, consequently, be imperfectly performed. Besides the formation of more perfect blood, there will be a necessity for the removal of that which is morbid.

With regard to deficiency of the vital fluid in the system, the remedy will be, in the efficient condition of the organs for its formation, and the removal of internal congestion, and the correction of its unequal distribution. "It is to be remarked, that deficient blood implies a much more advanced and complicated character of chronic disorder than mere mal-distribution in a frame well supplied with blood. Hence the Water Cure requires to be more carefully applied, and for a longer period, in the case of bloodlessness, than of simple visceral congestion. You have not only to *distribute*, but to *make* the blood as well." "One striking and excellent feature of the Water Cure is, that the same appliances which *indirectly* aid in the formation of improved blood, *directly* aid in its improved distribution." (Gully.)

The means principally relied on, and which are more ostensibly operative in the change of the blood, consist of the collateral, yet essential part of the Water Cure;—exercise in open air, and water drinking. This brings us again to the *chemical agency* of the water treatment. We must go in our philosophy, however, beyond the bare *chemistry* of the matter before us, in the consideration of the changes produced. It is ever under the control of the *organic vitality*. We thus arrive at the appropriate division of the effects of the water treatment;—the first is the *better distribution of blood*, and produced chiefly, by the external applications,

or processes ;—the second is the *change of the mass of blood*, produced by the internal use of water, and exercise in the open air. In treating of the interesting subject of animal chemistry, we are again on the authority of the illustrious Liebig. He has demonstrated, that the blood contains all the elements of all the solids and fluids of the body ; and that the process of supply and waste, or *change of tissue*, is continually going on. That this is chiefly effected through the action of the oxygen, in the arterial blood, on the ultimate textures of the body, under nervous influence. The rapidity of the waste and supply, in the *transformation of tissue*, is greatly varied by the temperature of the air inspired, and the degree of exposure of the surface of the skin. That this process is also hastened by a full supply of water to the blood ; and by breathing cold air, and the exposure of the body to it ; and by exercise in walking, so as to quicken the respiration and circulation, and to exercise the nervous power. Further, that whilst the digested food furnishes the material for the supply of the waste, and a proportionate amount of water, and air and exercise are taken, the condition of *health* is maintained ; the waste and supply are equal. But when the supply of nutriment exceeds the waste, because of deficiency of water, and of air, and exercise, diseases of *repletion* and *inflammations* occur. When the contrary conditions obtain, we have diseases of *depletion*, and *emaciation*. We have a satisfactory explanation in Liebig's theory, of the chemical effects of the water treatment in changing the blood by air, exercise, and water drinking, and in expediting the *change of tissue*.

The regulation of the water drinking requires the spe-

cial direction of the physician, as does, indeed, every other part of the treatment. In this, the patient is liable to err, because of the circumstances and phases of disease, which often make it necessary to vary the quantity to be taken, and sometimes, even, its temperature; and the time of taking it. The same caution applies to exercise. This should be always regulated according to the requirements of the case, and never should be left to the judgment of the invalid.

Lastly, on this interesting topic of the rationale of the Water Cure, let my reader remember, that there are three principal objects to be accomplished by it, in practice;—to secure a more equal distribution of blood;—also the formation of healthy blood;—and to cleanse the blood of its impurity. That all the means and appliances tend directly, or indirectly, to these purposes. And as the distribution improves, so also does the formation of better blood: and the *change of tissue* being more effectively performed, the removal of all impurity, and the substitution of healthy and pure blood, are accomplished.

The external appliances act directly, in effecting *the better distribution of blood*; and the internal use of water, with air and exercise, act also directly, *in changing the mass of blood*.

CHAPTER II.

THE PROCESSES OF THE WATER CURE, AND THEIR ACTION ON THE HUMAN BODY.

Quotation from Wilson—Recapitulation of important points—
Knowledge of physiology and pathology necessary for success—

ful practice, as remarked by Gully—The author's experience—Fomentations—Wet Sheet Packing—The compresses—The Sweating processes—The Wet Rubbing Sheet—The Sitz Bath—The Shallow Bath—The Douche Bath—The Shower Bath and Rain Bath—The Hand and Foot Bath—The Plunge Bath—Spinal Washing—The Head Bath, and Eye Bath, and minor ablutions.

The Water Cure may challenge the closest scrutiny of the physiologist, and it is only in total ignorance of its nature, and to be regretted, that any one really worthy of the name, can oppose its progress. "A weighty matter for reflection, that when *such a system* was struck out in the *solitudes of Silesia*, how singular to find it in curious and minute accordance with the teachings of the exactest science of the day : to find it, when carefully bottomed and analysed, a system based on the very constitution of man's frame, and now taught and enforced by every fact of Anatomy and Physiology, Pathology and Chemistry ; a system at once harmonizing with the philosophy and reason of things, and justifying its abstract pretensions by *practical proofs* without number, and without parallel. And this system we owe to the creative genius of Vincent Priessnitz, and the *providential circumstances* by which he was surrounded." (Wilson.)

We now proceed to treat of the Water Cure processes, and their inseparable adjuncts, diet, light, air, exercise, and clothing. My reader must have clear views on the action of each of these, in order to possess a correct understanding of the effects of their combined influence, as a remedy ;—the remedial power of the Water Cure ; and its strong claims to his confidence and perseverance, whilst under treatment. *In limine*, on the threshold of this part of our treatise, we recall his attention, for a

while, in brief recapitulation of the principal subjects of the preceding part. He will consider the very important functions of the skin; also, the capillary blood-vessels, and the production and regulation of animal heat. That by the capillary vessels, and the *organic system of nerves*, and the action of oxygen, are produced the chemico-vital processes, the *change of tissue*, secretion, and excretion;—the building up of the new, and the taking down of the old and wasted fabrics of the human body. That the blood of the arterial capillaries affords the supply, and the venous capillaries remove the waste, and the organic nerves are the vital power, and oxygen the chemical agent. Again, that the grand process of nutrition, for the maintenance of the body in its integrity and health, is appropriately divided into two parts,—the formation of healthy blood, in digestion and respiration; and—the application of it, to the purposes of the system, in circulation, and the *change of tissue*. That, as the proper distribution of the blood is the necessary condition of healthy functions, and of these, the essential one of proper blood-making, so, its correction, when unequal, becomes the primary aim of Water treatment. Another object of treatment, and in connection with the first, is to secure the perfect performance of the *transformation of tissue*. That in the derangement of this process, may be the first link in the causation of disease: its imperfect performance, through deficient oxygen in the air we breathe, and want of exercise, and other, and like causes, may produce the worst effects on the organic nerves, and their centres, whose disorder will become the cause of the other train of evils. It is however, the peculiar excell-

ence of the Water treatment, and in unison with nature's beneficent rule of Hygiene, that all its means, under skilful direction, co-operate in their tendency to the same great purpose of health. That the means which operate directly, in effecting the equal distribution of blood, tend indirectly, to secure its proper quality. Again, that the means of direct operation, for improved quality, operate also indirectly, for its better distribution,

It is, clearly, of vast importance, that a correct judgment be exercised in appreciating the nature and extent of disease to be treated ; for the proper adjustment of the different water processes, according to the precise nature of the case, and its different stages of treatment. How erroneous the published opinions of some non-professional hydropathists, and intended in commendation of the *safety* of water treatment ! as correctly remarked by Dr. Gully. "Knowledge of sound physiology and pathology are never more required than in the practice of the Water Cure ; and in no system of treatment will the great truths of those sciences find more ample and beautiful confirmation."

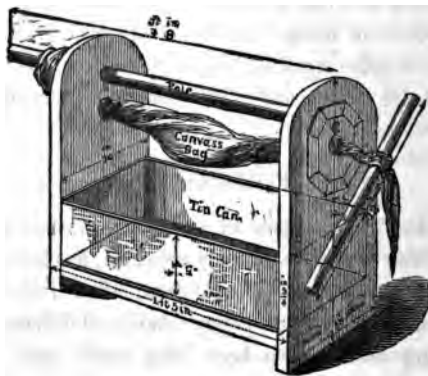
In giving account of the Water processes, it would be difficult to make any classification of them, which would be entirely without exception, if intended according to their operation ; of some of them the effects are so greatly modified by their temperature, and duration, and other arrangements, which may become necessary ; and any division of them is of less moment, provided that every process be correctly described, and its different modes of operation be also explained. I write from ample and personal experience of the nature and effects of the different Water Cure appliances, in a course of

full treatment of at least eighteen months' duration, in the large Hydropathic Establishment of Dr. Wilson at Malvern. I was altogether about three years in that institution. During more than two years of that time, I acted in the capacity of assistant, or colleague, with its architect and its owner, the physiological practitioner of the Water Cure. And during seven months of his absence in travel, the whole practice of it, amongst the numerous patients, was under my exclusive care. These favorable circumstances ought, at least, to have enabled me to form a correct opinion of the various means and appliances of the Water Cure; and of its own entire nature and value. Moreover, a previous period of about thirty years, in connection with the system of drug medication, and the greatest part of that time spent in the practice of every branch of the profession, ought, at least, to have qualified me to form a correct opinion of its entire nature, and of its comparative merits.

§ I. FOMENTATIONS.

The local application of warmth and moisture, the fomentation process, variously modified, has been known and practised in the world, from time immemorial. Chamomile flowers, and poppy heads, and different herbs in boiling water, have been long used; and, to the specific virtue of these, have been ascribed the good effects which frequently resulted; although their chief purpose must be as a medium for the heat and moisture,—the real and efficient agents in the process. This is a very powerful remedy against local irritation, external and internal. In hydropathic practice, it is very frequent-

ly resorted to, and usually answers every expectation of the physician : much care, however, is requisite in the performance of it, to secure its best effects. According to the requirements of the case, will be the duration, and the temperature. Fomentation is performed by means of flannel, three or four times folded, and wrung, as dry as possible, out of hot water ; and then applied to the part of the body to be fomented. These flannels may be wrung in a towel, and by the hands of the bathman : but by far the easiest, and best method of preparing them, is the invention of Dr. Wilson of Malvern. This is his *Fomenting Machine*, of which I give the representation. It is simple and cheap, and can be made by any carpenter for a few shillings.



Fomenting Machine for wringing a flannel out of hot water.

The wooden bar, an inch and a half in diameter, serves to carry the machine, and is a little thicker inside the holes, to resist the inward pressure, when the piece

of canvas is tightly twisted. It is held firmly by the left hand when the handle is turned round. The piece of canvas is simply tied with twine to the protruding end of the bar, and the same to the handle. The piece of canvas should be thirty inches by fourteen inches, to hold the flannel, and to leave some to spare for fastenings, and the shortening when twisted. The tin can, to receive the dripping, is moveable, and made to fit. There is no ironwork, and it can be taken to pieces in a few minutes. The half yard of flannel is dipped in a can of boiling water at the side, and laid on the canvas, and twisted as dry, as possible.

The patient should be in bed, in the recumbent position, during the time of hot fomentation; and the evening is very suitable for its application; also, early in the morning, that rest may be taken after it; for, exercise should never be taken immediately after, as it would greatly neutralize its soothing effect on the nervous and vascular systems. On applying the wrung flannel to the part to be fomented, a double fold of thick, and dry flannel, is placed upon it, and the ordinary bed-clothes are to be drawn over the patient. A better plan, however, is in previously placing a blanket, of small size, under the patient, and so folded lengthways, that it will cover the whole abdomen in its breadth; this should be placed under him, with its middle part in contact with the centre of the spine, and its ends being loose, and at each side of him, for the purpose of being wrapped over the wrung flannel, after its application. Another freshly wrung flannel takes the place of the former one, every eight or ten minutes of the whole time prescribed for the fomentation.

This process is powerfully soothing and remedial, in the very numerous cases of irritation of the *organic nervous centres*, implicating the organs of digestion,—the stomach, the duodenum, and the liver ; also the small and large intestines, and extending to the uterus, and the kidneys, and the bladder : for this, the wrung flannel ought to be sufficiently large, to cover the abdomen. Frequently have I witnessed the most satisfactory results, from the fomentation thus applied ; and this happy effect is often manifested by the patient himself, who tells of the great relief he has derived. The effect, at the same time, is no less powerful and salutary on the *animal nervous centres*,—the brain, and spinal cord, with their innumerable nerves of sensation and motion. Often have I seen the perturbed and anxious mind, tranquillized ; and the fretful and wakeful, calmed by it, into refreshing sleep : spasms, and pain, and uneasy sensation, are subdued by it, when other means have failed. Many are the good effects of fomentation ; and the previous experience of them, often makes the patient request its repetition.

This more extensive process on the abdomen, has been termed *general fomentation* ; as its effects extend to the entire organism. That has been termed *local fomentation*, which is confined in its application and effects, more particularly, to a part of the body ; as a joint, affected with rheumatism, or gout, or a particular nerve under neuralgic pain.

The operation of this process is decidedly *derivative*, and *soothing*, in cases of visceral congestion, and irritation : hence, the signal benefit derived from it, in relieving vomiting, and purging, and headache, and

neuralgic pains ; also asthmatic paroxysms, which have their source in the disordered viscera. The temperature of the wrung flannel is a matter of great moment, and must always be regulated according to the desired effect to be produced. In the more severe kinds of irritation, or incipient inflammation of internal parts, as of the larynx or windpipe, of the stomach, of the lungs, and of the bowels, in which we want a powerfully derivative action, the temperature ought to be the highest,—hot as possible to be borne. Again, when the irritation is of more purely nervous character, and the object is chiefly to soothe, we apply the flannel only at a temperature of *comfortable warmth*. In a certain kind of stomach irritation of this nature, and belonging to that usually termed *nervous dyspepsia*, fomentation, of a very high degree of heat, will cause harmful disturbance of the brain, and exasperate the malady of the digestive organs. There is also a certain point, or degree of the process, as to duration, or as to stimulation, in its effect on the skin, beyond which, it will be likewise to do harm : this is known in the excessive excitement of the heart and arteries, indicated by palpitation ; also in the undue excitement of the brain and spinal cord, as seen in headache, and restlessness.

In the soothing and salutary influence of fomentation, when applied to the epigastrium, or pit of the stomach, in cases of severe injury by external violence, it is of great power : and superior to that of any other means. In these cases, attended with much cerebral disturbance, its action is most satisfactory, and is plainly on both systems of nerves. Frequently there are cases presented for treatment, in which, for the first week or two, or

longer, this process applied to the abdomen, is the chief means which can be used with propriety; so low has become the *organic power* for the necessary reaction. Yet, in due time, the central organs being liberated by its use, from their congested and oppressed condition, and the due power of the *organic nervous centres* being restored, the subsequent treatment by the other appliances, is safely, and successfully proceeded with.

In the treatment of fever, and after its reduction by wet sheet packing, and when the patient's return to bed becomes necessary, fomentation to the abdomen will usually cause a free perspiration, and prevent any return of the complaint. And in various affections, this properly managed process becomes a valuable remedy, either for alleviation, or for cure; and alone, or in combination with others of the Water treatment. Locally applied to joints affected with rheumatic, or gouty inflammation, also to parts under neuralgic pain, I have known it of benefit, whilst the original seat and cause of the diseases were being treated with other appropriate means. Also in affections of the chest, in asthma, and consumption, it has been of service moderately applied at bedtime. And in states of mental exhaustion, or excitement by worry and anxiety, and in occasionally severe treatment by the other appliances, and when its excess has been indicated by nervousness and *malaise*, the fomentation to the region of the central organs, with repose for a while, will constitute the best means of alleviation.

During the last twenty years, and previously to my very fortunate acquaintance with the Water Cure, I frequently resorted to hot fomentation against inflam-

mation of different parts of the body; and constantly used it immediately after the application of leeches; and with the best effects; and was never disappointed in my calculations respecting it. It is a rule in hydropathic practice, never to apply this process within two hours and a half after a meal, as it would interfere with digestion. We usually foment for about an hour; sometimes, however, for but half a one. The duration will always be according to the necessity of the case, and sometimes, a longer time will be required. Its repetition must also be regulated according to circumstances.

§ II. WET SHEET PACKING.

Had Priessnitz never achieved anything beyond the discovery and introduction of the Wet Sheet Packing, as a remedy among mankind, he would have lived to good purpose, and would have done them great service. Every hydropathic practitioner, fully competent to appreciate the value of this process, depends on it, as one of his chief remedies: and such it is, whether it be regarded in its beneficial effects, or in the very extensive class of diseases against which it may be applied with the greatest benefit. Its curative action on the human body may be also greatly modified by the mode of applying it; and it may be thus adapted, to a great variety of disorders.

The operation of Packing is always performed on a hair mattress, with suitable pillows for the head to rest on. On this is spread a dry blanket, to cover its whole surface. A sheet of strong linen, or of such material

as the case may require, being wrung out of cold water, is then spread out, so as to cover this blanket. When the patient has extended himself, at full length, on this sheet, his attendant bathman folds it entirely over him at the sides and feet, so that his whole body, except the head and face, be enclosed in close contact with it. The blanket beneath him is then also wrapped over him; and upon this are placed additional blankets, to be tucked well in at the sides, to prevent all entrance of atmospheric air. Great care should be taken with the packing about the neck, that no air may have entrance there. Upon the four or five additional blankets, well secured all around the patient, a down coverlet, or bed of fine feathers, and made for the purpose, is placed and adjusted, to cover the whole; and thus the packing is completed. This is the description of a *full and single packing*; so called in contradistinction to other modes of doing it. This is the usual mode, when the patient, after remaining the prescribed time, has to be removed from it to the shallow bath, and then to dress, and take exercise. But in certain cases of a high degree of fever, or of inflammation, the sheet has to be removed, and another, and perhaps another, to take its place, at certain intervals of time, before the final shallow bath be given. In such cases, fewer blankets are needed; and thus, according to the requirements of the case, in the judgment of the physician, the Wet Sheet Packing is adjusted and managed. Frequently, only the trunk of the body is enveloped in the sheet, whilst the lower extremities are wrapped in dry blankets. Sometimes, only one or two wet wrung towels are used, instead of a sheet: again, the sheet is sometimes ordered of thick, or of coarse linen; sometimes, of thin calico.

Another point, and greatly modifying the action of the process, and not considered according to its importance by many practitioners, is, the degree of moisture. It is usually too much insisted on, that the sheet be wrung *as dry as possible*: this, undoubtedly, may be, and indeed, is requisite in some cases; but I feel convinced from experience and observation in many instances, that much more frequently, the sheet ought not to be wrung to such extreme dryness: especially in cases of fever, and in cases in which the soothing and sedative operation for sleep, is more particularly wanted. In cases of extreme cerebral and nervous irritation, I have ordered, that a considerable degree of moisture be retained in the Packing Sheet, and with the most gratifying results. Of this kind, I had under my care at Malvern, the most severe case I ever witnessed. It was Delirium Tremens, and the most severe Epilepsy, conjoined; with great disorder, congestion, and irritation, of the digestive organs; and particularly of the liver. It was necessary to have two or three men constantly up with him; for he had raved and babbled, nights and days: and the usual drug remedies,—opiates and stimulants, were useless. I ordered the wet sheets in succession; and each of them to be imperfectly wrung. He was thus enveloped four or five times, and had two cold shallow baths; and this treatment becalmed him into about forty eight hours of almost consecutive sleep, from which he awoke rational, and was soon restored.

The *full packing* in the Wet Sheet, is the part of our treatment the most dreaded by those who have had no experience of it; and it is usually pointed at by the opponents of the Water Cure, in order to terrify; and

yet, by all, without exception, who have had experience of it, it is declared the most agreeable, and the safest of the processes. We have the graphic description of Sir Ed. Bulwer Lytton in his "confessions of a Water Patient."—"The first momentary chill is promptly succeeded by a gradual and vivifying warmth, perfectly free from the irritation of dry heat. A delicious sense of ease is usually followed by a sleep more agreeable than anodynes ever produced. It seems a positive cruelty to be relieved from this magic girdle, in which pain is lulled, and fever cooled, and watchfulness lapped in slumber. The bath which succeeds, refreshes and braces the skin, which the operation relaxed and softened. They only who have tried this, after fatigue, or in fever, can form the least notion of its pleasurable sensations; or of its extraordinary efficacy; nor is there anything startling or novel in its theory."

This process stands unrivalled in its excellence, as an anodyne;—to procure sleep, and to allay mental and physical irritation. It acts with most soothing effect on the brain and spinal cord, through the innumerable nerves sent from them to the skin; and which are often morbidly sensitive. It is hence, that the patient usually sleeps whilst packed, and when he can scarcely do so without it. I have ever found that sleep procured in the Wet Sheet, is of very restorative nature, and calm, and dreamless; whilst that of the preceding night, perhaps, had been of opposite, and distressing kind to the patient. My own personal experience of the packing is, perhaps, beyond that of any other person; and repeatedly, indeed, have I gone to an extreme extent in its use, for the purpose of investigating its nature, and

its power. Previously, however, to any experimental packing, I had derived the greatest benefit from the process, as part of my Water treatment of about eighteen months. Whenever anything had occurred to cause me a sleepless night, or to render the little I had had, disturbed and unrefreshing, I found a never failing compensative means in the wet sheet, as soon as my faithful bathman, Saunders, entered my bed room, at early dawn; and an hour or two of most refreshing sleep in the "magic girdle," and a cold shallow bath after it, always restored the normal condition of the system.

After packing, the nervous energy of the skin is increased, and it is in the best condition for the shallow bath which has to follow. The brain has been soothed and refreshed; the whole body has been rested; its *organic power* is now able to react; and the shallow bath follows with salutary effect. Occasionally, however, the Wet Rubbing Sheet is more suitable; as when the *vita* has been greatly exhausted, by long and previous illness. The repetition of the packing process, in the course of treatment, greatly avails to restore the healthy condition of the skin; and thus to relieve and restore the internal organs. Hence its greatly remedial operation, and its very extensive employment by the scientific practitioner. Its power in allaying irritation is extraordinary; and when correctly modified, according to the state of the case under treatment, it is the most effectually soothing application to the sentient skin, that can be used. It has been properly compared, in its action, to that of a poultice to the entire surface of the body. It reduces the burning heat, which goes to con-

vert the moisture of the sheet into vapor ; and thus the patient experiences the softening and calming effects of the vapor bath. Beyond this, however, the moist state of the surface of the body, is the necessary condition for *exhalation*, on which the very important chemico-vital processes depend ; as Liebig demonstrates, in his excellent work on the subject. It is a law of the animal frame, that the motion of the fluids from within, is promoted towards membranes by the evaporation on their surface. The skin, and the lungs are, in this way, the chief agents in the motion and distribution of the fluids of the body : and the wet sheet packing becomes effectual for equalizing the circulation of the blood.

The reader, the water patient, will scarcely need to be cautioned against a common mistake, that perspiration is increased in this process. Yet it is inserted in a book, by a London physician of extensive practice, and who sits down to write in disparagement of the Water Cure, that the wet sheet packing is a sweating process of *extreme severity* ! Most assuredly he is in entire ignorance of the subject, about which he writes so confidently, and so wrongly ; for this is always effected by other, and very different processes,—the lamp bath, and the blanket packing. In the reduction of fever, by wet sheet packing, the sheet is renewed, when the morbid heat of the skin returns ; and according to the circumstances of the case. When this reduction has been accomplished, the relief derived from the process, is remarkable ; and is often gratefully expressed by the patient himself. The exhalation from the skin has been produced, and the fluids have been moved from the internal congested viscera ; the blood circulation has

equalized ; the nerves have been soothed ; and on patient's return to bed, the *spontaneous perspiration* naturally takes place ; or it is aided by mild fomentation to the abdomen, as noticed before, when treating of that class.

In the treatment of chronic diseases, which constitute the usual class at Hydropathic Institutions, the wet sheet packing is of the greatest service. In these, we have to soothe the irritation of nerves, to equalize the circulation of the blood, to determine the movement of fluids to the surface, and to relieve internal congestions ; to promote the secretions and excretions : we have also to eliminate morbid matters. We have to quiesce the brain and spinal cord, with their system of sensitive nerves ; and we have to give power to the *visceral, or ganglionic nerves and their centres*, on which depends the well-being of the animal economy. This sheet packing is found to be a very valuable remedial agent for these purposes, aided by the others of the Water Cure.

It is not easy, very satisfactorily, to explain its action in eliminating the morbid products of the human body, by the skin. The fact, however, is undeniable ; and frequently have I observed it. I have known when the patient himself, on being unpacked, has desired the immediate removal from his room, of the sheet he had been packed in, on account of the offensive fœtor arising from it. I could specify particulars of different cases. The severe one of diseased liver, and fever, which I attended with Dr. Wilson, two years since, and which case is noticed in his excellent work, lately published, on the Water Cure, was a remarkable one. The sheet packing, and the water of the shallow bath

which followed, were stained of a yellow color, and to a strong dye. Extreme as was the diseased condition of that patient, he was restored; I attended closely on that case throughout: and I observed, that the time of this skin purgation, was the starting point of time of his convalescence. This phenomenon of cutaneous elimination, and of substances of various appearances, constantly occurs in that large Institution. Sometimes, it indicates the presence of certain medicines, which had been taken before the water treatment commenced. But the circumstance is constantly observed at Malvern; and on the compresses worn by the patients. It appears in various stages of treatment; and often, in the more advanced ones. It was conspicuous, however, from nearly the commencement, in that of the gratifying case of my much esteemed patient, Mrs. I., of Manchester, during her stay of six months of last year at Malvern. Her kindness will allow me the unasked privilege of briefly alluding to it. This lady was brought in a very helpless condition, and after many years of drug treatment, by the skilful of the profession at home. Unable to walk, her only exercise had been chiefly in her carriage, into and out of which, she had long needed to be helped. For the first week or two of the water treatment, her only exercise was in a Bath chair, in which she was wheeled about in the garden. But hers was a suitable case for the Water Cure. Her *organic power* was yet good, and needed only to be released from the burden of congestion of the central organs; and especially of the liver; and the *organic nervous centres* to be soothed of the irritation which disordered them. This was accomplished by fomentation; and in due time, the wet sheet

ing, the lamp bath, and the sitz, with the compresses, resorted to, and with the best result. She was of mind, and it was made up, that she would do her part in the treatment. She did it, and had her reward. Though she had been in a state so helpless, and painful, any years previously, and under medical treatment; during the last few weeks of her stay at Malvern, she had not have been seen, every morning, taking her walk for breakfast, over the summit of the Beacon Hill, surrounded by the Wyche, a distance of about five miles. These parts will be known to some of my readers. But the point of interest, which led me to this notice of the case, was the great elimination of morbid matters, which depended on the compresses to the knees, and the abdomen, as, also, on the packing sheet. That on the 17th, appeared of medicinal character. But a change took place in their appearance, as she progressed towards recovery; and ultimately, we had evidently an elimination of bile, with which the wet sheet, and even the drying sheets were impregnated, and stained of a yellow color. The wet sheet packing is directly sedative, or lowering, anæsthetic, and soothing: hence its great use, by all practitioners, in the active and commencing stage of fevers, and inflammations of the stomach, the lungs, the brain, and other parts; also in that of acute rheumatism, and the exanthematous diseases, small pox, scarlet fever, and measles. Great care and judgment are required for its proper use and management, however, in these affections. Whenever the skin is dry, and the pulse is high, and the pulse is high, it is the best and safest remedy. It is truly deplorable, that it is not practised, at this time, in every hospital, and by every medical man

in this kingdom. The day is not far distant, however, when it will supplant the very inferior means now in use.

The full packing is improper in those states of the body, in which there is indication of deficient vital power; in the stage of fever, in which the pulse beats feebly, and slowly; and when the skin is cold. Also, in chronic disease, when there are symptoms of exhausted nervous energy, to such extent, that the needful reaction would not take place; the patient would not become warm in the packing. In such cases, a less degree of the process may be sometimes administered with the best effects; by relieving the vital organs. This will be in the *half-packing*, so called, including only the trunk of the body in the sheet. Here I may observe, that it is occasionally necessary even in the *full packing*, to leave out the upper extremities, at the first time or two of taking it, on account of the particular nervous dread of the patient, against being bound up so entirely. I have seen those who could not shake off this feeling, during the whole time of treatment. Again, we sometimes pack only with towels. In whatever degree it may have been undergone, it is the rule, that a wash down, or a shallow bath, or a rubbing sheet, should follow, and finish the operation. It is quite evident, that immediately after packing, the skin is not in a fit state for the patient to dress and take exercise: but it is in the best for receiving the tonic operation of the bath which follows; and after this, he ought to walk. He will feel in the most comfortable condition for the exercise, and will take it with pleasure, and much benefit. Sometimes, it is advisable to keep out the feet, and even to wrap them in dry flannel, during this process. There are other

minor arrangements of the kind, which are occasionally made, in order to secure the reaction.

As to the precise length of time to remain in the wet sheet, it cannot, in all cases, be fixed beforehand. The patient should never be unpacked before he be thoroughly warm in the sheet; for, this is the evidence that reaction has taken place. The most usual period for this, is twenty minutes, or half an hour, ere it be perfect; and an hour is the full length of time usually prescribed for the patient to remain packed, from first to last. Yet, he will often get over the chill, and be in an agreeable state of warmth, after the first ten or fifteen minutes. Of this hydropathic appliance, as of all the others, the entire management must be, in every particular, according to the requirements of the case. The early morn is decidedly the best time for it. The heat of the surface of the body is then most equal, and the vital energy is greatest, for securing the full benefit to be derived from it; and it greatly prepares the body for the morning walk before breakfast, which is by far the best of the day; but more of this when we treat of exercise. The symptoms denoting that the patient has stayed too long in the packing, would be those of headache, and a sensation of fainting: in these signs, a predisposition to irregular circulation in the brain is manifested; and it may be necessary to apply a wet towel, or a wet double fold of linen to the forehead, before commencing the operation; also to shorten the duration of it. These symptoms show to the physician, that in the case, the packing is liable to pass from its soothing to its irritating action, and care should be taken in its management.

Amongst the many good effects of wet sheet packing, we mark the restoration of the healthy action of the mucous membranes, and that especially of the bowels; hence its frequent usefulness in the removal of obstinate constipation, by restoring to the lining membrane of the colon, its due quantity of blood, which had been diverted to the other organs, in their state of congestion.

No doubt, this invaluable remedy will be, at a future day, a subject of medical history: it will be recorded that it had been confined so long to the practice of hydropathic practitioners, notwithstanding its undeniable efficacy in their hands, and the many cures they wrought chiefly by its means; and although these were accomplished in strictest accordance with the acknowledged principles of physiology and pathology, this priceless remedy had been so long excluded from the hospital, and private practice of medical men. And of this kind, no doubt, will be the tenor of the future historical records of the Water Cure itself. When it has taken its own appropriate place amongst the legitimate sciences; and has been owned and cultivated by the learned of the profession; and has reduced drug medication, to the use of but a few of the simplest and mildest medicines.

The present opposition to this physiological and philosophic system of water treatment, is but a commentary on human frailty, continued from times past. Its professional opponents are under the impression, that it is in antagonism to their system, and their immediate interest. They remain in voluntary ignorance of the real principles of Hydropathy; and really to investigate them, would be inevitably to admit their identity with those of the fundamental sciences of medicine, as a

profession: but their minds are prepossessed by the mistaken notion just alluded to; and thus far only will they proceed. This is the wonted method of mankind; and the same erroneous motives of resistance have ever actuated them, under like circumstances. Often as it has been referred to by previous writers on this subject, we will here make brief reference to it. Opposition is no disparagement: for, the most valuable discoveries in arts and sciences have met with it; and on the same grounds. Without further particulars, we need but repeat the names of three professional men, Harvey, and Jenner, and Gall; and we may also allude to steam, and printing, and machinery: the things in connection with these, have long been established as of the greatest importance and utility to the world, although they were much opposed at their introduction.

Dr. Southwood Smith has truly remarked, in his excellent work, "The Philosophy of health."—Cotemporaries are seldom grateful to discoverers. More than one instance is on record, in which a man has injured his fortune, and lost his happiness, through the elucidation and establishment of a truth, which has given him immortality. It may be that there are physical truths, yet to be brought to light, to say nothing of new applications of old truths, which, if they could be announced and demonstrated to-day, would be the ruin of the discoverer. It is certain that there are moral truths to be discovered, expounded and enforced, which, if any man had now penetration enough to see them, and courage enough to express them, would cause him to be regarded by the present generation with horror and detestation." The concluding sentence

of this statement has, already, abundant illustration in the opposition, which the genuine source of all moral truth, has to contend with in the world;—in the opposition of sceptics of all shades and characters, to the Sacred Volume, whilst in total ignorance of its contents, beyond the impression, that it is in antagonism to the principles and practice of their lives. My reader must allow a brief digression further. The neglect and dislike of this “wondrous book,” prevailing in the world, would be an incomprehensible circumstance, were it not in perfect accordance with its own declarations;—
παι γαρ ο φαυλα πρασωνι μισει το φως, και ουκ ερχεται προς το φως ινα μη ελεγχθη τα εργα αντου.
John 3. 20.

One would suppose, that such extraordinary excellencies of literary and most sublime character, as are those of the Bible, would, apart from other considerations of greatest moment, secure its perusal and estimation by the intellectual of mankind. We have no other history so ancient and instructive; we have no poetry so sublime. Homer, in all the grandeur and euphony of the Greek language, and John Milton, in his noblest poetic flights, in our own English, become comparatively vapid, and scarcely readable, on our coming to them fresh from the soul-inspiring page of sacred poetry. The latter great poet, and magnanimous man, has told us, in his prose works, that “those frequent songs throughout the law and the prophets, not in their divine argument alone, but in the very critical art of composition, may be easily made appear over all the kinds of lyric poesy to be incomparable.” No wonder, that the sensual and besotted Tom Paine could see

nothing beyond "unmeaning rant" and "wrinkled fanaticism" in the inspired and sublime language of the prophets and apostles! No wonder, that the vain and dolized Voltaire could ridicule the Sacred Writings, in the hour of health and wealth! These men were totally incapacitated for forming any just estimate of them: as well ask yon poor idiot, to discuss with you the principles of Newton;—as well ask yon deaf one, to expatiate on the extatic compositions of Handel and Mozart! *ψυχικός δε άνθρωπος ου δεχεται τα του Πνευματος του Θεου· μαρτια γαρ αυτω εστι ου δυναται γινωαι οτι πνευματικως ανακρινεται.* 1 Cor. 2. 14.

It is not sufficiently known, that the chief excellence of English literature and poetry has been derived from the Bible; and it is not sufficiently considered, that to it we chiefly owe our liberty, and our learning. It were easy to trace the connection; and the men of greatest intellect and genius, and who have been ever looked on, by their fellow-men, as the ornaments of the human race, have been greatly privileged in their much perusal, and high estimation of the Inspired Writings; amongst these were Newton, and Locke, and Bacon, and Boyle, and Milton, and Grotius, and Haller, and Boerhaave, and Euler. But the great subject is endless, and draws us off from our original one. I am aware that this digression may be supposed an improper one here, by some of my readers: I am also free to suppose, that there is a morbid and silly sensitiveness, which too readily repudiates such reference to the most weighty and dread concerns of the human soul, and its vast interest. No valid reason can be rendered for this repudiation: no other, forsooth, than that it is unwelcome.

Every other topic is admissible for much more lengthened allusion to it: and under almost any circumstance of composition: be it—the carnage of war—the wrangling of politics, or the attractions of literature and science of any kind; but this, which is of superlative nature, and has ever engaged the noblest minds in the world, and ever occupies the highest intelligences we can conceive of, must be discarded entirely from our minds, to give exclusive place to others, of infinitely less moment. We cannot discard entirely from our bosoms, however, that these will soon pass away as a shadow, whilst the former will, one way or other, intensely engage us for ever.

§ III. THE COMPRESSES.

Three distinct kinds of Compresses are used in Water treatment; and much benefit is frequently derived from their use. They may be considered as partial Wet Sheet Packing, and they are certainly very efficacious in their operation. The most extensive one is the *Abdominal Compress*; and of this there are two kinds, the original one is the *Grafenberg Compress*, which consists of a piece of sheeting, or towel linen, long enough to go three times round the body; and of sufficient breadth, to extend from the pit of the stomach to the hips; and having tapes attached to it at one end, for securing it; also long enough, to pass thrice round. In applying it, as much of the other end of the compress, as will fold once round the body, is to be wrung out of cold water; the whole is then carefully rolled up on itself, beginning at the end with the tapes, so as to finish with the

moistened part. This is then to be applied to the abdomen; and in the unfolding of the whole compress, the body, from the stomach to the hips, becomes encased in it, being, in fact, in nearly a half wet sheet packing, with two folds of the dry linen held tightly on by the three rounds of the tapes; and the dress above all, as the upper covering, instead of blankets. The patient can take exercise in this, instead of keeping his bed, as with the packing process.

The other kind of abdominal compress is usually termed, the *Malvern Compress*. It is a modification of the former one, and was contrived by Dr. Wilson, when he commenced the Water Cure practice at Malvern. In his own words, when treating of the *Grafenberg Compress* in his lately published work on the Water Cure. "This we called "*Neptune's Girdle*" I wore it in this form at Groefenburg, but finding some discomfort in having the wet application on the loins, I contrived a linen belt, with four strings, having the *wet part* or compress separate, covering the *anterior part*, and extending only half or three quarters round, as I have mentioned in my *first* work on the Water Cure. This answers every purpose in most cases, and the wetted part can be extended over the kidneys when required.

This linen belt can be taken off and replaced more easily than the long bandage, and it admits of the convenience of placing oiled silk, or a fold or *two* of flannel over the moveable piece of wet linen. I find the dry flannel particularly useful where additional *warmth*, and not heat, is required; it has also the advantage of absorbing the vapor, and preventing the dry linen belt from becoming damp."

The other and third kind of compress consists of folded pieces of wet linen, in size according to the part to which it is to be applied; upon it are placed folds of dry flannel, or oiled silk, or Mackintosh; and the whole is secured in the most convenient mode. This is the *local*, in contradistinction to the *abdominal* one, which is the *general compress*. It is the *Water Dressing* of Surgeons, when applied to wounds, and has been practised, with the best results, for ages. The famous Ambrose Paré wrote on its excellence; as did also Fallopius, and Laurent Joubert, also Samorier, in 1732, others of great celebrity also, have published on the same subject. Lombard, and Baron Percy; and at this time, it is practised in this country. I well remember the use of an extremely cold compress, with ice wrapped in it, by the celebrated Baron Larry at the military hospital at Paris, and which he applied for the reduction of an Aneurism: (enlargement of an artery.) and in what triumphant manner he told us to inform Sir Astley Cooper that we had witnessed the good effects of the application. I suppose that these two great Surgeons had had some dispute on the subject. These local compresses are in constant use at Hydropathic Establishments. We apply them over gouty and rheumatic joints; and on any part affected with inflammation, as the tonsils, and the eye. They are effectual in relieving pain from tension of the inflamed texture of ligaments and muscular sheaths. I have ever found them of least service where the pain has been of *neuralgic* kind. In toothache of the inflamed kind, it is of marked efficacy; whilst in that which arises from sympathy with the stomach, it has none. Nevertheless, in severe parox-

ysms of Sciatica, a large compress to cover the part affected, and to go round the thigh, has been of service, in union with other means, applied to the central organs. In cough from bronchial irritation, the compress may be applied to the chest; and at same time, care must be taken to have it perfectly covered, to secure the proper action, and it will promote expectoration, and thus reduce inflammation. In some cases, there is a liability to nervous and sympathetic disturbance, from too long retention of the compress on the chest, without change; as I have seen, also, in the abdominal one; as palpitations, and faintness, with hysterical breathing. Care should be taken to avoid these, by duly renewing the wet linen at proper intervals; besides, not to continue the appliance too long.

I have repeatedly witnessed the same kind of elimination of morbid matters, and of various appearances, in the use of local compresses, as in that of the wet sheet packing; and, in the same individual, the same kind of staining of the sheet has made its appearance also on compresses applied to the abdomen; and on those which have been worn on the extremities it is often observed.

We proceed with the *general or abdominal Compresses*. Whatever ground there may be for preference of the *Malvern* to the *Græfenberg* kind, in certain cases and circumstances, I am decidedly of opinion, that also in many instances, the latter kind of compress is the best, and will answer some needful purposes, for which the other cannot be so well adapted. Repeatedly have I had to order the adoption of the Græfenberg compress in preference to the other, and less extensive one, in its application and action. I have always had the Græfen-

berg compress so made for my patients, that it has every advantage which Dr. Wilson contrived for the Malvern one, excepting only, that of more ready change. It has only to be constructed at the wetted end of it, that additional folds of linen may be admitted with the covering of oiled silk, or Mackintosh, when they are wanted for more moisture, and its longer retention; and we attain the object; and we can use it to produce either the soothing and emollient action, or the rubefacient and derivative; or, that of cooling and sedation, according to management. It is frequently desirable that the application be to the posterior, and the lateral, as well as to the anterior regions of the body, at the same time. This may be necessary, not only because of the position of the affected organs, but also that the nerves of those parts may be subjected to the action required. Again, we have much more perfect support afforded to the lumbar muscles, and to the spinal column itself, through the use of the Groefenberg compress, than by that of the other. In certain cases of muscular debility, and where the erect posture of the body, and a moderate degree of exercise, are required, the superiority of the same is evident, as a mechanical aid, apart from its other properties. The Malvern Compress may be considered as a milder means, and adapted for application to the region of the stomach, and the abdomen; and when it is desirable to exclude the lumbar regions entirely from its operation. It certainly has the advantage of being more readily changed.

The remedial action of these compresses is soothing and emollient, as is that of a poultice. It is also rubefacient, and derivative, as is that of a blister: and it is

cooling, and sedative. These effects are produced, and modified, by proper management. The more soothing action is secured, by placing oiled silk, or Mackintosh, above the wet linen, in order to prevent evaporation; and thus we have the best of poultices, and the sweetest and cleanest. For the derivative, and rubefacient action, we cause the linen to be more thoroughly wrung out, and then to be applied very smoothly, and close to the skin; and above it are to be placed several folds of dry linen. For the more cooling and sedative effect, the linen should be well soaked, and on being applied, it will do better without much covering; but it will be necessary to renew it more frequently, when we wish to accomplish the object of lowering, or sedation; as against local irritation, or inflammation.

The principal object of the abdominal compress is that of its soothing, and counteracting influence on the irritation of the internal viscera. There is ever an intimate sympathy between the internal organs, and the external covering of the abdomen; and hence, the efficacy of this simple means, in the treatment of many diseases: and so many have their origin in irritation of these parts. Much care is required in the management of this means; for the same cause, of existing sympathy, makes it produce great disturbance and mischief, when it is mismanaged, either in the mode of its application, or in the time of wearing it. I have known the sympathy become so exquisite by disease, that the compress was productive of faintness, and headache, and heart palpitation, and other distressing symptoms; so that it could only be worn at certain intervals of time, and required to be refreshed more frequently. It often has the effect

of increasing the secretions of the bowels, and acts as an aperient. The correct explanation of this action is, in its soothing and counteracting the irritation of the digestive organs, by which the supply of blood to the colon is restored, and with this, the function of its lining membrane, as treated of before.

The salutary influence of the compress, on the brain and spinal cord, is frequently manifested, in raising the spirits, and more particularly, in aiding the patient to take exercise; this, it also effects through its action on the internal abdominal organs; however, it must also have a more direct action, through the innumerable nerves of the animal system, sent from its great centres to the skin. It should never be worn during meal time, nor for two hours after it; because it is liable to divert the blood from the stomach, which is needed in larger quantity at the time of digestion. It scarcely ever fails to cause an eruption, of one kind or other, on the skin underneath it; sometimes, this is as a rash; at other times, large pustules, or even small boils; sometimes, vesicles; again, it is common to have a viscid exudation on the part, by which the internal surface of the linen is stained of various colors, and of offensive odour. The elimination of various substances, spoken of in treating of the packing sheet, is far more frequently seen on the abdominal compress; and often to a great extent, and of various characters. Whatever may be the physiological rationale of this remarkable phenomenon, the fact of its constant occurrence is established, although certain writers of the medical press of this country have so strangely questioned the possibility of it! But one becomes impatient in further attention to this vexed

subject. We leave it, as far as these opponents are concerned. The interesting phenomenon occurs in more intense degree in cases of marked disease of the digestive organs ; and more especially, in that of the liver, and where there is great congestion of old standing. Indeed a large proportion of the cases under hydropathic treatment, partake more or less, of this character.

§ IV. THE SWEATING PROCESSES.

In Hydropathic practice, there are two acknowledged modes of effecting purgation of the skin ;—two sweating processes. The original one, and used by Priessnitz, is the *Blanket Packing*. The other is the *Lamp Bath* ; a much more powerful, and effectual means for the purpose ; and withal, more manageable, to produce any degree of operation desired ; and which has, therefore, greatly superseded the use of the former one, as a separate process.

The Blanket Packing is performed by spreading out two large blankets on a mattress, with pillows for the head to rest on. The patient having lain down, these blankets are carefully folded over him, so that they fit closely about the neck, to prevent any admission of atmospheric air ; above these are then placed additional blankets, which are also carefully tucked in around him, and a down bed, or coverlet, is placed above all, and properly adjusted.

The duration of this process is from two to five hours, to accomplish its desired effect, according to the necessity of the case. The great length of time required for its due operation, is a strong objection to its use ; and it is

chiefly resorted to when there are urgent reasons for its preference, or insuperable objections to the use of the other mode of sweating ; and such is a rare occurrence in practice. The greatest value of blanket packing, is as an adjunctive, or additional means of sweating to that of the lamp bath ; and here it is, occasionally, of very great utility. We can thus produce an evacuation by the skin, to any amount ; and possess in it, by skilful management, a most efficacious remedy against some diseased conditions of the human body, in which all drug medication becomes quite ineffective. The sweating process of the water treatment, including always the immediately consecutive cold shallow bath, in some form, or degree, and under competent direction, is an invaluable means of curative art. Unless the human mind be stayed in its present progressive march, and art and science stand still, this part alone, of the great Water Cure, will hereafter prove sufficient to supplant a large proportion of that complex pharmacy which has long prevailed in this country. The usual method of drug practice is to produce sweating by medicinal sudorifics, which operate through the medium of the stomach ; and they are very uncertain in their operation, and frequently produce the directly opposite effects to those desired and required. Quite otherwise, and very superior in every respect, is the result in hydropathic practice. We have perfect command at all times, and can secure by skilful management, the precise extent of operation we require : and, instead of exhaustion, and other derangement of the body, ever inseparable from the sweating by drugs, most skilfully done, we find our patient in a buoyant and active state for the walking

exercise he has to take after it. Besides, we can repeat the sweating process, according to our wish, and with the greatest benefit. And we can adapt it to the extremes of youth, and of age ; and, indeed, to every circumstance of disease in which it becomes necessary.

In administering the Lamp Bath, we have a wooden chair, on which the patient sits, quite undressed, during the process ; having a cushion beneath him, for protection from the heat of the chair bottom, caused by the lamp, which is usually of tin, and with a wick, and is supplied with spirit of wine. It is placed on the floor, under the centre of the chair. A small tin cup, four inches in depth, and three and a half in diameter, will answer the same purpose, wanting the wick, and containing only the spirit of wine. As soon as the patient is seated, with the spirit lamp under him, his attendant bathman arranges five or six blankets over him, placing them alternately, one from behind, and one from before, fitting each one closely to the neck, to keep in the heated air ; and thus placing the patient as in a conical tent, with his head out of its centre and its apex. He usually begins to feel the perspiration trickling down his sides, in the space of fifteen or twenty minutes ; but in this there will be much difference. Very often, it will commence in ten minutes ; and in summer, even in five : again, it will require half an hour, or longer, in the winter season. It is usually more difficult to produce full sweating, at the first time or two of undergoing the process ; and it becomes more easy at every subsequent period of it. I have sometimes ordered the feet to be placed in warm water, in order to hasten the operation, for urgent reasons of the case ; and sometimes linen

cloths, wrung out of cold water, to the head, to protect it from excessive afflux of blood. Occasionally, also, to the region of the stomach, and to various parts of the body, I have prescribed the application of flannels wrung out of hot water, whilst the patient was in the lamp bath. Each of these plans is occasionally resorted to, for the special purpose to be served, and according to the circumstances of the case.

We have also a great advantage in the increased effects we can secure, by removing the patient from the lamp bath to the blanket packing, at certain stages of the first process; and, in order to continue the sweating. It is done occasionally; as in treating cases of chalky gout; and in chronic rheumatism; and in dropsical affection of certain kind; and in chronic liver disease. Sometimes, however, the removal is practised without any special view of increasing the discharge of sweat, but simply because of the patient's inability to remain the due time in the posture of the lamp bath; therefore the recumbent one of the other process becomes necessary for the remainder of the operation.

This operation of sweating, whether performed by the Blanket Packing, or by the Lamp Bath, is a very powerful remedy. In both kinds of these processes, it is the effect of heat, which is a powerful stimulant. In the blanket process, the stimulation to profuse perspiration is effected by the heat which is constantly being generated by the living body; and which is retained, and accumulated, by means of the non-conducting envelope of blankets. In the Lamp Bath, it is the communication of heat *from without*; in the Blanket Packing, it is the retention of heat *from within*, which causes the

sweating. Under the usual circumstances of life, the due temperature of the body is preserved ; the heat is supplied by the chemico-vital actions of the frame, which are increased according to its abstraction. Again, as we have pointed out before, the increased exhalation from the surface, the conversion of water into vapor, as it escapes from every pore, and absorbing superfluous heat, is the established provisionary means of preventing the undue increase of temperature. The hydropathic sweating processes are scientific arrangements in relation to this law or provision of the body, by which we make it subserve the purposes of curing disease. The accumulation of heat, by our artificial contrivances, *excites the ganglionic nervous system to conservative action*. Through this, the action of the heart and arteries is increased ; the blood is circulated with speed and augmented impulse, obstructions are removed, a great movement is made, and a strong determination of the fluids from the internal to the external parts of the body ; whatever may be the temporary obstruction of the skin, *the central and organic effort* soon overcomes it. The sweat is poured forth, and the superfluous heat of the body is extricated ; with these, too, comes relief, and the subsidence of the organic commotion raised for the purpose.

It is quite evident, that an excitement so powerful, of the cutaneous circulation, and causing the diversion of fluids from the internal to the external parts,—from the central and vital organs to the skin, must necessarily turn to good account against internal disease ; and much, in skilful hands, is accomplished by this means. Frequently have I witnessed its effective remedial operation in congested and enlarged liver, to an extent I

could not have expected from any other remedy : and hence, its great efficacy against indigestion, and gout, and rheumatism, and dropsy, when they have their cause in the diseased condition of that organ. Occasionally, and after repeated use of this process, the perspiration becomes more profuse, and impregnated with odours of various and disagreeable kind. Sometimes, it is viscid, and glutinous, and of various shades of color; and frequently, it becomes sour, and of offensive odour. When of such unusual character, we consider that it is of a *critical* nature. During the whole time of this sweating in the lamp bath, the patient is supplied with cold water, and is also urged by his thirst to drink it, at proper intervals; and usually in proportion to the drain by his skin. It answers very useful purposes :—in encouraging perspiration—in refreshing the system whilst under the operation of the sweating process;—and this imbibition of pure water under the circumstances, must also tend to purify the blood, in the substitution of a purer fluid, for that which is evacuated from the surface, and is so frequently impregnated with various impurities.

Often have I had to contend with the prejudice and fears of patients, respecting the sweating process; and who have been strongly prepossessed with the notion of its very *weakening* effects: and experience had to convince them of the contrary. No fear can be more groundless than is that respecting the lamp bath as a debilitating process in water treatment. Properly prescribed and administered, with its consecutive cold bath, it is of the contrary tendency. It will often dispel from the mind the clouds of gloom, and will shed on it the

bright beams of light, and life, and cheerfulness. It is not the loss of so much fluid, and often of morbid nature, that can possibly operate, in debilitating, or exhausting. "As a general rule, where there is no evident reason why this process should not be used, sweating, followed by the cold bath, is *not* debilitating; what is lost in one way is repaired in another. The appetite is so much increased, and the functions of the skin and digestive organs so improved, that the loss of a little fluid by sweating has only a salutary effect. Fat is replaced by hard elastic flesh, and languor and debility give way to a state of cheerfulness and activity." (Gully.) Again, we must also understand, that it is not by the profuse sweating, merely, that relief, or cure, is brought about. The great curative effect is on the circulation of the blood, through the *organic power*, in equalizing its distribution, and in improving its quality. The sweating, as we have explained, is but the effect and indication of the successful effort, made by this *organic and only power*, for restoring the normal condition of the animal system. Precisely in the same light, ought we to regard the different *crises* on the skin; the consequences of a similar effort, under circumstances of internal disease. In commencing the treatment of some cases, we cannot proceed sufficiently far in the process to produce perspiration, because of taxing too much the animal system, which is indicated by severe head symptoms; and we are then satisfied with that degree of the operation, which has brought increased heat and blood to the surface: and, by its regulated repetition, with the favorable influence of the other processes, the patient bears,

with safety and ease, the full operation of sweating.

The application of a cold bath, whilst the body is in profuse perspiration, has startled the minds of even medical men ; and notwithstanding the many instances, on well accredited record, of its perfect safety. We need not recount them here ; but observe, that it is rather remarkable, that any lingering doubts should still exist on the subject, whilst constant experience is against them ; and there is not the least physiological ground for their existence. After all that has been advanced on the excellence of the sweating processes, it is needful to say also, that great judgment is necessary for their proper administration. And in the hands of the inexperienced, much harm may result from their use. They are inadmissible in states of great excitability ; in very acute catarrhs, and influenza ; especially when the heart palpitates from trifling causes ; and in all cases where there is marked determination of blood to the head. In the commencement of fever, especially in that preceding the eruptive diseases of small pox, and measles, and scarlet fever : also, in certain states of chronic inflammation of the lining membrane of the stomach and bowels, so often the cause of hypochondriasis. Sometimes the misapplication of this process is indicated by the experience of the patient, who does not progress in recovery, under its use. He loses flesh, and becomes irritable ; and from some peculiarity of constitution, it is not adapted to his state. In such cases, and in the states above specified, in which the sweating process is contraindicated, the Wet Sheet Packing carefully managed, can be used with the very best results. “ Whenever there is a great tendency to

fever, where *acute* symptoms of a cold or influenza are coming on, the sweating must not be attempted: it sometimes aggravates all the symptoms. In these states the sweating must be replaced by the wet sheet. I have observed that those whose skins are white and delicate; persons who have much fat, gouty and rheumatic, sweat easily, and in great abundance. On the other hand, where the temperament is phlegmatic, where there is a tendency to piles, or congestion of the abdominal viscera, it is not so easy." (Wilson). In my own personal experience, so great, and so long at Malvern, I learnt much of the effects of frequent and excessive sweating. And I have seen them in that of others: these are manifested by symptoms, in many respects, resembling those of contraindication, and described above; especially those of great excitability of the heart, and head; with sense of *malaise*. Yet the lamp bath, with its inseparable after-bath, is a remedy of priceless value: and greatly to be lamented is the fact of its remaining still unpractised by, and unknown to, the drug practitioners. It alone would most efficiently supply a want, so constantly felt in their practice; and for which the entire materia medica is comparatively useless; the want of a means by which to open the skin, with as much certainty of operation, as belongs to the many purgative medicines for the bowels.

It may be added, that "The act of passive or artificial sweating, without being followed by the different modes of ablution we enjoin, would not be attended by the curative results either immediate or remote, we accomplish. The bath is the *sine quâ non*: without this addition, its efficacy would be lost in the treatment

of slow or chronic disease. This is the reason, why so great a remedial agent is all but negative, in the hands of the medical profession. They know only of the *debilitating sweating* by drugs and vapor bath." (Wilson.) No doubt, the after-bath which finishes the process, is of the highest importance, and may be truly said to possess a special potency, under the circumstances, which it cannot have at any other time. The condition of the tissues of the skin, and that of the entire organism, is then specially favorable for the beneficial influence of the bath.

There is in the world a practice of hot air, and vapor bathing: wherein the individual is included entirely, so as to breathe the hot air in the box, or the room, in which he is confined. This is a very objectionable and hurtful mode of sweating; and needs but few words to point out the evil of it. This artificial atmosphere must be most unfit for respiration, because of its deficiency of oxygen; also because of its being impregnated with the noxious exhalation of the diseased body. There are other, and cogent reasons, against such baths; but these are sufficiently urgent to warn against their use.

"It is in complete opposition to the principles of the Water Cure, to *inhale* heated air at all. Rightly proceeding on the doctrine that the blood is to be rendered healthy, so as to permit the body to work its own restoration; the admission of pure cool air into the lungs, for the purpose of oxygenizing that fluid, is above all essential. Now hot air, being rarified, does not contain one half the oxygen that cold air does, and the blood consequently loses just by one half its vivifying and

strengthening agency: the dark blood from the veins is not sufficiently changed by the air, and a blood unfit for the purposes of life is allowed to flow through the body, and especially in the brain, where it congests and produces the tense headache that attends the inhalation of hot air. The consequence of all which infallibly is, that when rheumatism, and one or two other complaints, are *relieved* by this hot air sweating, (and they have been so relieved), their return may be relied upon; no *cure* has been effected, because the very first principle of cure,—the formation of a healthy, rich blood, to enable the body to effect its own restoration,—has been sinned against. It is one of the abuses of the Water Cure that ought to be deprecated by all who understand that cure and wish it success." (Gully).

The early morn is the best time for the sweating process of the lamp bath, when no valid reason exists against that time of taking it. The only other seasonable time of the day for it, is at noon. However, the arrangement of the time, and the other particulars, must ever be according to circumstances.

In some cases, the douche after the sweating process, is to be preferred to any other bath: and sometimes the shower, or rain bath: sometimes the wet rubbing sheet; but most frequently, the shallow bath, cooled down from 70° or 80°, to the lowest temperature. Walking exercise should be invariably taken, where possible, immediately after the process.

§ V. . THE WET RUBBING SHEET.

Whatever may have been advanced in disparagement of the practice of Vincent Priessnitz, by the opponents of the Water Cure, the unprejudiced and discerning mind will perceive the footsteps of genius, in his somewhat irregular career. His negative qualities of being untaught in anatomy and physiology—his being without medical education, become as the shades of his mental character, which place in more striking light, his faculty of inductive reasoning. That he possessed this, is demonstrated; also that he constantly exercised it, in the gradual advancement of the Water Cure, from the imperfect thing at the beginning, to the perfect system it arrived at, by his own creation. It is in the separate processes, and their connexion with each other, as united in physiological action, that the genius of Priessnitz is seen. Although his own ideas of the rationale of their operation might be deficient, they were indubitably in accordance with physiology in their extent. "His theories were necessarily crude, and many of them quite erroneous: still it is a matter for reflection and wonder, how much he did, and what *pregnant truths* he hit upon without the aid of any elementary knowledge. Although water had been used as a remedy for ages, and justly vaunted for its *wonderful efficacy* in many cases, still there existed really nothing worth calling a system for its application, before his time. In contriving the different processes, he has shown considerable genius, and it is surprising how comparatively little in that way he has left for his followers to do." (Wilson.)

The Wet Sheet Packing has been considered "one of

the finest discoveries of Priessnitz," and with equal correctness the Wet Rubbing Sheet, of which we now proceed to treat, has been termed "one of his admirable practicable discoveries." It is applied in the following manner :—A large and strong sheet is steeped in cold water. When taken out, it is slightly wrung, just to prevent much dripping. The patient stands with his back to the bathman, who dexterously throws the sheet over him, so that an equal portion of it cover the body, with the head in the central part. The patient immediately lays hold of the fore part of the sheet, and with all his power, he rubs his face and chest, and all the front part of his person : at the same moment, the bathman performs the same operation on the back, and loins, and lower limbs. This is continued for two or three minutes, when the wet sheet is replaced by a dry one, and the friction is again commenced, and continued until the whole surface be well dried. The impression of cold is only momentary, and is soon succeeded by agreeable warmth. The process is usually enjoyed, and is highly invigorating. The action is of highly beneficial kind, and it is greatly valued in the water treatment. It is a very salutary stimulus to the nervous systems, animal, and organic ; and rouses the energy of both. It exhilarates, to a sensible degree, for the moment ; and its daily repetition tends greatly to give permanent and vigorous action to the skin ; and thus to aid the internal organs, in throwing off the disease of irritation and congestion oppressing them. Most frequently it is used as a finishing process, to follow the wet sheet packing, or the lamp bath ; much less frequently, however, after these than after the sitz bath. With the last

it is usually combined; sometimes indeed, to precede it, but most properly in a large proportion of cases, it follows it, and puts the body into a very suitable condition for the walking exercise afterwards. This combination of the sitz bath and wet rubbing sheet, repeated twice or thrice a day, and when properly prescribed, frequently forms of itself, a very effectual remedy in many cases of relaxed and atonic states of the system.

This process is frequently used at the commencement of treatment, as a means of preparation, in cases where the patient has not been previously accustomed to the application of cold water, and is sensitive and fearful. Its continued use is a powerful means of restoring the normal measure of blood to the vessels of the skin, and to fix it there. It becomes evident, that it must have great effect on the brain and spinal cord, through its stimulating operation on the innumerable nerves which are sent to the skin, from these great organs of animal life: and thus, indirectly, also on the viscera of digestion and circulation. Hence its great influence in dissipating the feelings of languor, giving, in their place, those of alacrity of mind and body. It also restores the appetite for food, and acts with salutary effect on the stomach, in removing thirst, and flatulence. However, we must look to the continued use of the wet rubbing sheet, for its more valuable results. In certain more severely disordered conditions of the animal nerves, it becomes an excellent remedy, in conjunction with the other appropriate processes.

In neuralgic and spasmodic affections, it becomes necessary, sometimes, to use several wet sheets in succession, in one process. Again, and on the contrary,

we sometimes meet with cases, of such organic feebleness, that we have to commence the application of the one sheet, in each process, with its temperature tepid ; and we get gradually to the lower degree of cold. Occasionally also, we need to commence with a less severe kind of the operation, in using only a towel ; and this, only applied in friction to the limbs, or to the trunk of the body. This process is, of all others of the Water treatment, the most convenient for use ; and may be easily performed, under various circumstances of travel, and at home. I have frequently used it after the Shallow Bath, and with the most satisfactory effect ; and, with the same result have I often prescribed it.

§ VI. THE SITZ BATH.

The mode of administering the Sitz Bath, requires but few words, for its explanation. During the process, the patient is seated in a bath constructed for the purpose, and containing the proper quantity of water, and of proper temperature. The parts of his body submerged are, his thighs, and hips, and the lower parts of the person. When no other process has to follow it, he may only arrange his dress, and without entirely undressing, for the Sitz Bath. Far more frequently, however, a Wet Rubbing Sheet has to be taken immediately after it, or Spinal Washing is conjoined, or some other modification makes it necessary that he be undressed. Indeed, it is the better plan to always undress for it. In such case, a large blanket should be thrown over his shoulders, and properly adjusted for his protection from harm : his lower extremities also should be protected.

The duration and the temperature of this process are regulated according to the curative purpose it is intended to answer.

For its tonic effect, we prescribe a shorter period of from five to fifteen minutes ; and the temperature should be the coldest. And for this operation, it is also necessary to use it more frequently ; to repeat the bath at shorter intervals. For the other objects, of its derivative, and sedative action, the continuance of it may be extended from twenty minutes to an hour, or longer ; and the water should not be of the lowest temperature : it should be regulated however, according to the organic capability of the patient. The degree of its derivative action will be, according to the amount of heat abstracted by the temperature and duration of the bath. The abstraction of heat, by a shorter period, and made more rapid by lowness of temperature, will produce a stimulant effect ; and the repetition of such action will produce one permanently tonic. Thus, Sitz Baths, and frequently repeated, three or four times daily, constitute an excellent remedy in the debilitated conditions of the lower organs of the body ; in prolapse of the uterus, and in excessive menstruation ; in leucorrhœa ; and in prolapsed rectum. Be it remembered by my reader, that the primary, and essential action of this process, is *derivative* ; that is, it causes a current of blood to be directed, or derived, from other, and perhaps, distant parts, to that part under the influence of its operation. And all the curative effects, resulting from its operation, ever depend on the degree and permanence of this derivative action ; whether it be tonic, or stimulant, or sedative.

For the stimulant operation, we prescribe a short

period of duration, and a low temperature ; for the tonic we prescribe the frequent repetition of this ; and for the sedative effect, we must have a longer continuance, and the temperature somewhat higher. Much of the philosophy,—the real rationale of the water treatment, is exhibited in that of the Sitz Bath. We see in its operation, the powerful stimulation of the organic and animal nerves: also the powerful derivation of fluids, from the internal parts of the body to the surface exposed to the cooling medium ; and through this, the augmented chemico-vital process of *change of tissue*, in order to supply the increased abstraction of animal heat. We see the surcharged and oppressed organs thus relieved of their excess of blood ; and its distribution equalized. We see also in this, its remedial agency in the removal of congestion of distant parts,—of the brain and spinal cord,—of the lungs, and the heart, of the liver, and the stomach, and bowels, constituting the different forms of digestive, and nervous disorders. A due and normal measure of blood being restored to the organs of the lower region of the body,—the urinary and genital organs, their secretions are also restored ;—the bowels are made to act ;—the periodical evacuation of females becomes regular ;—and the kidneys, and the bladder, discharge their functions regularly. In all this, we keep the eye of our mind on the roused energy of the *organic power*, which is the essential agent in operation. In addition to the improved distribution of blood, thus brought about, we see, as a necessary consequence of it, the restored functions of the organs exercised for its formation of healthy quality. This process is thus shown to be a means of no secondary

capability. in the instrumentality of the Water Cure. It is indeed. an invaluable remedy. It may be administered at any part of the day, at a sufficient distance from meal times ; and walking exercise should always be taken immediately after it.

The effect of the Sitz Bath is increased by friction vigorously applied to the submerged abdomen and loins, with the wetted hands of the patient ; and he may be assisted in it, by the attendant bathman. It is to be observed, however, that this friction, by the patient himself, is only allowable where the stimulant and derivative action is required. On the contrary, where it is administered for a *sedative operation*, the exertion would be injurious, in counteracting the effect intended. Under these circumstances, the friction by the hands of the bathman alone, must be practised, and only in certain cases, is this required. As remarked before, in respect of other processes, and which cannot be too much enforced on the mind of my reader,—much care and discrimination are requisite, in prescribing this process in continued treatment. Safe and very efficacious in competent hands, it becomes capable of working much injury, in the hands of the unskilful. As written by the learned, and pious Boerhaave, an ornament of his profession, “*nullum cognosco remedium, quin solo tempestivo usu, tale fiat.*”

We sometimes have a modification of the Sitz Bath, denominated, the *running Sitz*. It consists of a contrivance with a pipe and stop cock, by which the cold water is continually admitted into the bath ; and in equal proportion it is let off. This is for the purpose of securing an equal, and continued degree of low tempera-

ture, during the process. It is only resorted to in urgent cases. In noticing this, I have ever in unavoidable association with it, the very successful treatment of a case of disease of the hip joint, which had been three or four months under the care of Dr. Wilson, before I went to his Establishment; and eventually forming one of the most remarkable cures, and a triumph of the Water system. The subject of it was a youth apparently in hopeless prospect of either remaining a helpless cripple through life, or of succumbing under an intractable malady. I watched the progress of recovery, during the remainder of the time. By the careful management of, at least, a year's duration, and in which Dr. W. prescribed the running Sitz, as part of the remedial measures, a permanent recovery was accomplished; and the patient is now busily occupied, in the pursuit of wealth, in a distant colony. I shall not easily forget the very severe derivative action produced by this process; and the extraordinary elimination of morbid matters on the surface of the compresses, and the Wet Packing Sheet.

Lastly, and respecting the efficacy of the Sitz Bath, in the usual mode of applying it, I can safely state from ample personal experience, in addition to the favorable opportunity I have had of testing its power in numerous patients, that it is a most valuable means. With the Wet Rubbing Sheet immediately after its use, it constitutes a favorite, and very efficient remedy, where debility, and deficient vital energy, are indicated.

§ VII. THE SHALLOW BATH.

This process is administered to the patient in a sitting posture, in the bath; with his lower extremities

extended in it, whilst it contains from six to ten or twelve inches of water. He applies vigorous friction to his limbs, and the fore parts of his body, whilst the attendant bathman is occupied in applying it to his back and shoulders. Frequently, more or less of cold-water is also poured over him : at all events, the friction with the wetted hands, and by means of a sponge, or towel, is a very necessary part of the operation. The usual duration of the whole of it, is from three to eight minutes : sometimes, however, the shorter period of one minute, is sufficient. We have, in this, the familiarly named *wash-down*, or *cold ablution*, or *half-bath*, a constant renewal of contact of the water with the skin, and a repetition of its stimulation is thereby produced on its texture, with its myriads of nerves, and blood-vessels. It may be made, in some measure, to supersede the other forms of cold bathing, and especially the plunge bath, which it has greatly supplanted in the water practice at Malvern. It plainly admits of much modification, as do all the other processes ; and thus, we can vary at will, the degree, as well as the precise nature of the operation. Herein consists one of the valuable practical excellencies of the Water Cure, and one of its great advantages. Very unreasonably do its opponents inveigh against the *oneness* of its remedial agency. It is because of its directly opposite nature, with its other superior qualities, that those who really understand it, prize it so highly. Its practical means are many, and in skilful hands, they can be easily varied, in their adaptation, to meet all the exigences of diseased conditions of the human system.

The Shallow Bath is the one hydropathic appliance

most frequently prescribed for the patient. It is usually the bath with which he commences the treatment ; and during its whole course, it becomes the complement, or finish, of the others. Its principal operation is as a tonic and stimulant. It may be considered as a middle process between the wet rubbing sheet and the douche, in its usual degree of power. There is a longer period, or stage of treatment of chronic complaints, in which the shallow bath is adapted and proper, than there is for the continued use of either the wet rubbing sheet or the douche ; the former becoming not sufficiently powerful, and the latter being too much so. The shallow bath is also used alone, or as a complete process, although it so often follows as the necessary sequel of other processes ; most frequently of the sweating processes, and the wet sheet packing. When taken alone, it gives vigor to the action of the skin ; and thereby benefits the whole body, and prepares it for walking exercise at early morn. The position of the body, in taking it, with the hips and lower extremities in the water, is a favorable circumstance, in promoting the derivative action from the brain and the digestive organs. This necessarily takes place in the salutary reaction, on coming out of the water ; and on having vigorous friction applied to the whole surface, in drying it ; and in the continuance of that reaction, by the necessary walking exercise afterwards.

It equalizes the distribution of the blood, relieving the congested and oppressed parts, to restore the normal measure of it to those which have been deprived of it. Its use, at first rising from bed in the morning, is strongly recommended to patients, as the most efficient means for preserving the priceless boon of restored

health, on leaving the Hydropathic Establishment, and arriving at home.

As noticed above, this is the standard process, to finish those of wet sheet packing, and the sweating operations. In these instances, it is of the greatest utility and importance. It braces the relaxed fibres, and the capillary vessels of the skin, and becomes a grateful tonic and stimulant. It restores the due action of the heart and arteries, which had been somewhat diminished by the wet sheet. Again, it agreeably cools the body, and reduces the pulse, and calms the general excitement, which had been produced by the lamp bath, or the blanket packing. After both processes, its equally opportune operation is manifest, and the appropriate repetition of these two-fold means, tends, in a powerful degree, to fix a proper quantity of blood on the exterior.

The use of this bath, of various degrees of temperature, and with very active and continued friction, has often proved a sovereign remedy in severe accidents, and shocks, and apoplectic seizures. In the hands of Priessnitz, it has done great things, in cases which were considered hopeless; as I have been informed by an eye witness. He himself, was twice snatched from the brink of the grave, through its use, and by his own orders: the last paroxysm, without it, destroyed him. Some hydropathic practitioners advise, that the temperature of the shallow bath after the lamp bath, be quite cold; and much has been advanced in favor of the *shock* to the nervous centres. However, I feel opposed to the sudden application of very cold water in states of much debility, at the first moment of the patients going into it, immediately out of the lamp bath. Much better

is it, to be tepid of 70° or 80° and rapidly cooled down to the lowest degree. It matters not so very much for the shock ; and every purpose of the double process is served by the coldness of the shallow bath at the time when the patient steps out of it, to dry and dress. Sometimes, I have known of the occurrence of disagreeable feelings in sensitive and susceptible patients, from the too sudden change, and indicating the repulsion of blood to the head. Perhaps, indeed, this might be prevented by causing the head to receive the first, and preparative shock of the cold water, instead of the lower parts of the body ; but the inconvenience is altogether avoided, by the management here recommended ; that the shallow bath be cooled down from tepid, to the lowest degree of cold, before leaving it.

The patient should remain a longer time in this bath, after the sweating processes, than after the wet sheet packing ; and for evident reasons. Two distinct effects have to be produced by it, under the different conditions of the body. Occasionally I have prescribed, in certain atonic states of the nervous system, that two or three buckets filled with water, be rather rapidly emptied on the head and shoulders, just before leaving the bath. This becomes a minor kind of douche, and with the desired effect. However, it is needful to have a just appreciation of the capabilities of the animal and organic powers, before the application of such means ; otherwise, much harm may be produced. This has taken place where the patient has prescribed for himself, without the requisite competence of judgment.

§ VIII. THE DOUCHE BATH.

This process has been long known and practised in the world, as a local remedy ; and it so remained, until it occurred to the fertile mind of Priessnitz, to use it in its more general application to the whole body, as a stimulating and revulsive agent. Previously to his time, it had been only applied, in an imperfect manner, by pouring water in a continuous stream, and frequently by pumping it, on diseased and stiffened joints ; and sometimes, on other strained parts of the body. In this very powerful process of the Water Cure, we possess the means of producing a remedial action, resembling that of the Shallow Bath, and the Plunge Bath, and the Wet Rubbing Sheet ; but much more intense in degree, and somewhat modified in its nature. The stimulation produced, by the constant change of water brought in contact with the skin, is much greater, as is also the amount and rapidity of abstraction of animal heat. In place of the friction by the hands, we have the effects of a heavy column of water, falling from a height of about twenty feet ; and of diameter, varying from one to three inches. The constitutional effects of the Douche are produced, through its action on the innumerable nerves, and capillary blood-vessels of the skin ; and through them, on the great centres of organic and animal life ; and on the heart and arteries,—the organs of circulation. The excitement of the texture of the skin is often very marked ; as seen in its redness and warmth. The increased activity of the chemico-vital process, the *change of tissue*, must also be great, for the supply of the animal heat so rapidly abstracted. The column of

water, falling on the course of the spinal cord, must have a powerful influence on it: and on the nerves and organs of animal and organic life;—on the brain, and the heart, and lungs; and on the other organs of the interior: and through the loco-motory nerves, on the muscular system. It gives a powerful revulsive impulse of the fluids, from the interior to the exterior parts; and when its use is persevered in, at the proper stage of treatment, it hastens, and intensifies the *crisis*. Applied for a short time, and at longer intervals, it is a powerful tonic to the brain, and the nervous system; and preserves the permanently healthy condition of the skin.

It is in its more frequent use, and more severe application, that it causes the constitutional excitement, and *critical* determination of the fluids to the surface of the body. Great discretion should be exercised, in respect of this powerful process: and, very careful investigation should be made of the diseased state the patient may labor under, at the time; and before it be administered to him. In the practice of a competent practitioner, it is rarely prescribed at the commencement of treatment; and then, only, when the patient is quite free of all constitutional excitement, and without any local malady, or fever, or inflammation. It is chiefly used at a more advanced period, and when these, or other ailments, have been subdued, by the other appliances of hydropathic practice.

Some ingenuity has been exercised in the invention of various forms of the Douche, and of different modes of administering it: but no improvement has been made in that, which was delivered to us by Priessnitz. The *ascending Douche*, so called, is the mode of apply-

ing a stream, or shower of water, to the lower parts of the body, whilst the patient is in the sitting posture. We meet with cases, in which this ascending process becomes convenient, and of good effect; and it is decidedly powerful: formerly I entertained a different opinion respecting it, but have since known of its efficacy against disordered conditions of the lower parts of the body, and to which females are liable. It is a valuable auxiliary means: we must ever remember, however, that local ailments are only the effects of constitutional causes, and effectual treatment must be directed accordingly.

The Douche is inadmissible whilst any local irritation exists in the body, in any considerable degree. There is however, a certain period, at which its violence has been reduced, and the *organic power* requires aid, in order to throw it off entirely to the exterior surface. In such case, this process becomes an opportune means; but experience and skill are required to decide on it. It is also inadmissible in apoplectic tendency,—in determination of blood to the brain, and accompanied by inflammatory condition of the digestive organs. Alike dangerous and improper is its use, when there are any indications of organic disease of the heart, or of the larger blood-vessels; and in the kind of dyspepsia attended with irregular state of the nerves of the digestive organs; and giving rise to feeble and irregular circulation of blood in the vessels supplying them, and manifested by hypochondriacal feelings of anxiety, and irritation, and depression of mind; also by constipation, and anorexia,—want of appetite.

The Douche, on the other hand, is of the greatest

service, when the inflammatory state of the digestive mucous membrane has been subdued by suitable treatment; by fomentation, and packing, and the Sitz Bath; and we require the permanently tonic effects of treatment. Moreover, in that state of obstruction, consisting in impeded circulation in the liver, and pancreas, and spleen, causing slow and imperfect digestion, with constipation, the Douche, may be beneficially used to stimulate the peripheral extremities of the nerves on the surface, and through them, to rouse the circulation, and to free the congested viscera. Again, we may safely and wisely apply this remedy, in the obstruction of the brain and spinal cord, giving rise to various degrees of paralysis, as seen in paraplegia, or palsy of the lower part of the body, inclusive of the lower extremities; and sometimes, of other of the voluntary muscles, and in different degrees of atony, or loss of power. In no class of complaints is there more, or perhaps equal, need of judgment, and skilful decision, of the physician, than in this of palsy; and need, essential need, of confidence and co-operation, on the part of the patient. My memory reverts to different cases I have seen under different practitioners at Malvern; cases in which the Water Cure had become the last resort to flee to, after the long, and useless trial of other modes of treatment. It ought to have been the first, on which to place reliance; for according to the dictates of physiology and pathology, I can conceive of no other means, so much adapted to the purpose of alleviation, or cure of this disease. The ground for hope of either, must ever depend on the nature of the case; and in some there can be none whatever, not,

however, in all: wherever there is no organic lesion, no disorganization of nervous, or other texture, there may be recovery to some degree or other, according to other circumstances.

This disease is of various nature, and attacks the nerves of motion, and those also of sensation. Most frequently both kinds are affected: often, however, there is a loss of the power of motion, whilst that of sensation remains, in various degree: sometimes, but much less frequently, the nerves of sensation alone, are affected. Its usual cause is in the brain; and it is the frequent companion of apoplexy. But we cannot particularize here concerning it, for it owns many connections, and varies greatly in its real character. Sometimes, it is certainly of comparatively less serious kind, and is removable, without much difficulty, by such means as are in hydropathic treatment. This will be the case when it is the effect of wrong circulation of blood in the brain: it becomes incurable, when there is disorganization of its substance; but this is a point not always to be easily and precisely determined. Here, and for the present, we leave it; with the confident assertion, that what can be done in paralytic affections, for their alleviation or cure, will be most readily, and most perfectly accomplished by Water treatment. And in the Douche will be an important part of it.

Much abuse of this process has been practised in treatment by unskilful practitioners, and frequently by patients themselves. It is certainly a means of great power, for purposes of treatment, in cases already alluded to; and of all hydropathic processes, it will soonest do much injury when improperly administered.

Occasionally the patient is induced to take more of it than was prescribed for him, being under the impression, that it hastens the *crisis*, for the conclusion of the treatment.

The column of water should never be allowed to fall on the head, nor on the region of the stomach; and with caution also, and by the physician's directions, on the upper part of the spine. It is also applied as a local remedy, in cases of rheumatic joints, and limbs, after the removal of the original cause, in the digestive apparatus, and blood-making organs. Walking exercise is ever enjoined to the patient, immediately after taking the Douche, and being dried, with due friction of the skin, by the drying sheet.

§ IX. SHOWER BATH AND RAIN BATH.

The Shower Bath is too well known to require any description of its form, or of the mode of administering it. The *Rain Bath* is but a name, applied to the former one, when the water issues from smaller apertures, and is impelled laterally, or in every other direction, on the body of the patient.

These baths are, no doubt, of great remedial efficacy, and their use is found to be very opportune, and effectual, in cases of disease, where a milder degree of treatment is required; and in which the nervous system is in an exhausted state; and the power for the generation of animal heat is also diminished. Their continued use, with their repetition, at proper intervals, twice or thrice a day, and with due friction applied to the skin, constitutes a very efficient treatment for restoring the nervous

energy, after the lengthened application of exhausting causes. The Shower Bath has properly become of frequent use, as a domestic means of hygiene. Perhaps its convenience has been as much thought of as its great efficacy ; but this is decidedly powerful.

The shock of this process is, perhaps, greater than that from immersion in water ; but it is sooner recovered from ; and this may be accounted for, from the less dense medium applied to the body, and thereby the less and slower abstraction of animal heat. In certain cases of unequal distribution of blood to the head, the patient may stand in hot water during this process : and this will modify its effects to his advantage.

The Shower bath becomes necessarily more severe in its effects, according to the increased diameter of the apertures, from which the water issues, and according to the duration of the process. One minute will often suffice for the cases in which it is given ; and this will have to be lengthened, in the more advanced stage of the treatment. In those, however, of greater nervous energy, and physical power, a much longer period will be required : in these cases, also, and when the smaller form of it, the rain bath, is administered, the patient may very advantageously apply friction to his body during the time of the process.

This bath may be used with much benefit after the sweating processes ; and in some cases, it will be preferable to all others, under the circumstances. However, it will then need to be continued a much longer time ; and this will be decided according to the condition of the patient,—until the perspiration be quite stayed, and the surface of the body be reduced to the proper

degree of coolness for drying, and dressing, and the necessary exercise, always to be taken immediately after it.

The Rain Bath, falling in all directions on the surface of the body, is a favorite remedy at Benrhydding, where it is often prescribed by the efficient practitioner of the Water Cure—Dr. Mc. Leod; and with very gratifying results; as has been testified by the many patients under his care. I made use of it at Malvern, only in its vertical form; but I am quite persuaded that there are frequent cases of disease, in which it will be a valuable auxiliary means; and in certain disordered and sensitive conditions of the nervous system, it may become an appropriate remedy, for which we could not readily find an equal substitute.

§ X. THE HAND AND THE FOOT BATH.

Deeply interesting is the consideration of the anatomy and physiology of the hands and feet, as organs of touch and prehension, and of standing and walking. For these purposes, we behold the most exquisite and perfect contrivance in their form and structure. Their mechanism is most admirable for all their uses. As parts of the wonderful fabric of man, surely, we cannot contemplate their adaptation, without feelings of adoration towards the omniscient, and ever blessed Creator. Stolid and unfeeling must be he, who can look with indifference on such divine workmanship, wherein are marked, as with the sunbeam, the proofs of beneficent design, and perfect wisdom. No wonder at the record of history, that the infidel and heathen Galen was

converted to a belief in the existence and providence of God, by his dissection of the human hand ; and that he afterwards wrote an excellent essay, "*On the uses of the human frame,*" and termed it "*A solemn hymn to the Creator of the world.*" "*I first endeavour from His works,*" says he, "*to know myself, and afterwards, by the same means, to show Him to others ; to inform them, how great is His wisdom, His goodness, His power.*"

A very large supply of animal and sentient nerves, is given to the hands and feet ; and they thus become connected, by the most intimate sympathy, with the great sources and centres of thought and volition,—the brain and the spinal cord ; and by these, are the movements and actions under the accurate direction of the mind. This intimate sympathy, by nervous connection, is made manifest by disease ; and by the pain usually attending it, when seated in these organs. We see it in *paronychia*, or *whitloe*, that particularly painful abscess, so frequently formed at the side of, or around the nails of the fingers. It is often of sufficiently severe nature, to cause great constitutional disturbance. No doubt, the unyielding nature of the texture, in which the matter is confined, accounts, in some measure, for the pain endured : besides this, however, we should consider, that the main seat of the sense of *Touch* and *Feeling*, when under inflammation and suppuration, must necessarily be that also of severe pain. Again, we find that on any part of the hands, or feet, inflammatory action is more painful than on any other parts of the surface of the human body. This is, because to them is a larger distribution of sentient nerves, and blood-vessels. Frequently have I had under my care, very severe cases of

constitutional illness and fever, involving the brain in delirious excitement, with the usual derangement of the central organs, from the most apparently trifling scratch, or puncture on the hand, or foot. Such is seen continually by medical practitioners. In illustration of this subject, we may consider *Tetanus*, in any of its dire degrees, and varieties : *Trismus*, or *Locked-Jaw* is, perhaps, the most frequently witnessed, and is caused by wounds of the feet, or hands ; and usually of the former. We behold, in this affection, the most violent disorder of the animal nervous system, caused, perhaps, by a slight irritation of some of its extreme branches, at the greatest distance from its centre and source. We are all aware of the great sensitiveness of the palms of the hands, and of the soles of the feet.

Lastly, it is to be remarked, that in the every-day practice of medical practitioners, the usual method of relief to the oppressed and congested brain, consists, in part, in certain stimulating applications to the feet ; and most effectually to the soles, on which is a network of sentient animal nerves. The palms of the hands are similarly supplied, and they, also, become a suitable part, to which are applied stimulant remedies for relieving the brain. There have been many very striking instances of relief obtained by these means, and after the apparent failure of other, and more violent ones.

I have advanced these observations on the operation of morbid causes, and of remedies, on the hands and feet, in order that the reader, the water patient, may duly appreciate the efficacy of Hand and Foot Baths. I have deemed it the more necessary, because I have known them much undervalued by those who are

incompetent to judge of them ; and who would, perhaps, much more readily place reliance on the more severe measures of the Douche, or the Plunge Bath. The operation of these processes to the hands and feet, is that of *revulsion* and *derivation*, which has been explained before : to draw the circulation of blood from the upper, and the central, to the lower, and extreme parts of the body. For this, the Foot Bath is most frequently prescribed by the hydropathic physician ; and certainly it is a powerful means, as has been often attested in its successful use, in cases having their cause in congestion of the brain and spinal cord :—In headache and lassitude, also in the nervous restlessness, called “ fidgets.” In the action on the central organs, and the organic nervous centres, both directly, and through the medium of the brain, and spinal cord, we find it effective against many distressing symptoms of dyspepsia ;—in relieving gnawing sensation, and that of sinking and nausea : and from the same action of the bath, will be often produced feelings of lightness and alacrity, in place of the opposite ones of dulness, and *malaise*, which previously annoyed the patient.

When the common complaint of cold feet, becomes the subject of much annoyance, and is the consequence of languid circulation, it is most effectually and permanently cured by Foot Baths repeated twice or thrice a day, and continued for a few weeks ; always taking care, that there be due walking exercise immediately after every bath. It is evident, that the hands and feet, under proper management, may be made a very efficient medium of derivation of blood, from other, and congested parts : whilst in the cold water of the bath, the feet

should have vigorous friction applied to them, by the attendant bathman; and they should be well dried; and also well rubbed, with the towel or sheet for the purpose.

We must not pass unnoticed, the use of *warm foot and hand baths*. They are made use of in daily medical practice; especially, the warm foot bath; and a very effectual remedy it is, under various circumstances, and where early relief is required. In sudden attacks of colic, and diarrhoea, and vomiting; also, in sore throat, and in congestion of the brain, from exposure to cold. The temperature of the water, in such cases, ought to be as high as can be well borne by the patient; and not below, from 100° to 110° . A useful addition will be found in a little flour of mustard, or of common salt, to the water; and hot fomentation should be continued to the abdomen, or to the throat, afterwards, as the case may require. In the water treatment of chronic diseases, the daily use of the cold Foot Bath, in conjunction with the other appliances, becomes an excellent aid in the cure: its action on the digestive organs is often remarkable, in reducing the congestion oppressing them, and the *animal*, and *organic nervous centres*. The effect of these foot baths, must, of necessity, be powerful on the nerves themselves; and through the dynamic, or nervous impression, conveyed to these animal, and organic nervous centres,—the *brain and spinal cord*, and—the *ganglia of organic life*.

Similarly to the Sitz, and other baths, the cold Foot Bath is essentially *derivative* in its operation on the human system; and whether we produce the stimulant, or the sedative degree of it, will depend on that of its duration, and temperature. For the former, or stimu-

lant, or refreshing effect, it should be of shorter duration; not beyond ten minutes, and oftener, five will suffice: its depth also, should not exceed four or five inches, and its temperature should be cold, or chilled, with active friction by the hands of the bathman all the time. Again, for the sedative, and the more decidedly *revulsive* effect, as in brain excitement, headache, and congestive state of the viscera, the water should be in large quantity, and the temperature begin at tepid, as 70°, and cooled down to 60° or lower; and the duration longer,—from twenty to thirty minutes; and much friction, as in the other, is here also necessary. The bath ever needs correct regulation, to meet the case in treatment; but reaction must be always secured; and the feet must not be cooled beyond it, as might be done by too much water, or too cold; or too long duration of the bath; and insufficient friction. These would be against, and not in favor of the purpose required in administering the Foot Bath.

§ XI. THE PLUNGE BATH.

The use of this process constitutes the cold bathing of the many, and outside the pale of the Water Cure. When used in hydropathic treatment, it is usually as a sequel, and to follow and finish some preceding process,—the Lamp Bath,—the Blanket Packing, or,—the Wet Sheet Packing: the Wet Rubbing Sheet sometimes either precedes or follows it; and more rarely, the Sitz Bath. It is, assuredly, the most ancient of baths, and known in all ages, and all countries of the world. It may be administered, so as to form, perhaps, the most

powerful that can be given, either in its primary action, as a shock to the whole animal system, or, in its more prolonged operation, as a curative agent. Nevertheless, its use is in some measure, superseded by that of other processes, in Hydropathic Establishments; and it is only prescribed for the more vigorous, in the advanced stage of recovery. Priessnitz ordered it for his patients, more frequently; and even at the commencement of their treatment: and he himself took it regularly every morning, during many of the last years of his life.

Notwithstanding the many treatises that have been published, exclusively on cold and warm bathing, and the much more numerous volumes in which it has formed one of the subjects treated of by professional and talented authors, we may safely assert, that previously to the time of Priessnitz, and the much maligned Water Cure, and its professional advocates, who have written to illustrate and defend its principles, there was no adequate, and really correct apprehension of the remedial power of water, in its external and internal application to the human body: the physiological rationale of its power to its full extent, was not known; and the capabilities of the organism of the human system, in arresting diseased action under that power, had never been fully appreciated. These remarks apply also, in some measure, to cold and warm bathing, in the common acceptance of the term, and as practised at the sea side and at spas, and watering places. In this limited extent of operation, as usually prescribed by the medical practitioner, it has been generally considered of doubtful efficacy, and of minor importance in itself. Whatever improvement might take place in the health of the

invalid, whilst sojourning at a watering place, it has been frequently ascribed to the change of scene, and of habits, and to his temporary withdrawal from those of more sedentary and hurtful nature. Very rarely is combined with these bathing expeditions, a correct system of diet, and a regularly apportioned exercise, with the other necessary particulars of regimen. By this omission, must have been greatly nullified any beneficial effects of the bathing, and the amount of real advantage to be derived, during a few weeks' absence from home.

Often has the thought occurred to me, to what much better purpose, in various respects, would the time have been devoted to treatment at a Hydropathic Establishment, under the superintendence of a competent physician. The real condition of the majority of those who make annual visits to Watering Places, is rarely of severe disease. It is most frequently that of functional derangement, and with the various forms of nervous disorder, the consequence of too sedentary habits of life. The most frequent source of these ailments is in the indulgence of luxurious living. In the long catalogue of previous errors, is usually to be placed the preposterous one of excess in diet, in combination with town life, and office, and other kinds of in-door occupation. Too often the resort, for a few weeks, to many of those fashionable Watering Places, which I could name, is more calculated eventually to increase, than to remove the complaints of such invalids. In many instances, the individual is without proper medical advice for his guidance, during his sojourn from home, and he too readily commits himself to that of his own feelings. The temporary excitement of the

change will often increase his already morbid appetite for the things most injurious to him ; and he finds abundant and inviting means at hand, for its gratification. During his short course of too much obedience to the Syren voice of pleasure, in attendance at balls, and concerts, and parties, he may mistake his momentary excitement, for progress in health : he may flatter himself also, that the present apparent impunity with which he proceeds, is the indication of acquired strength : but his return to the wonted occupation of home, will, ere long, dissipate the delusion ; and he may have again to resort to the pill and potion of the apothecary ; and will have learned nothing respecting the laws of health, but that his time of absence has not been spent in restoring his own. This is no artful picture for the occasion, but a passing allusion to the kind of life pursued by many at fashionable Watering places ; and of the amount of benefit derived from it. How different, and how greatly superior, the result of a residence of even a few weeks, at a Hydropathic Establishment under competent superintendence ! The invalid is there placed under stringent regulations, and not only receives the greatest amount of benefit, for the time devoted to it, but he learns important lessons of himself, and of his physical constitution. Whilst obtaining the blessing of health, he may there also learn the practice of the best means for its preservation.

In the advancement of the public mind in useful knowledge, and especially in that of anatomy and physiology, and the laws of health and disease, the highest purposes of public benefit will be served, in the practice of the most rational means for the preservation of

health, and in the selection of the most scientific for its restoration, when lost. In gratifying evidence of progress already made in this direction, we look upon the establishment of Baths and Wash-houses in so many of the large towns, and cities, of this kingdom. This has been long wanted amongst us, and our destitution of such sanitary means, left us behind our continental neighbours, in this respect; and tended, no doubt, to add in no slight degree, to our bills of mortality. At some future day, and I trust, not very distant, a valuable extension of the practical utility of those places will be made; and it might be done at a trifling expense, and without affecting the purpose for which they stand at present adapted. I allude to the arrangement for some of the Water Cure processes, under competent surveillance. How much more effective means, for frequently arresting disease at its onset, would be thus provided for all classes of men and women! By the use of the Wet Packing Sheet, or the Lamp Bath, would often be arrested, fever, and many acute diseases, having their cause in obstructed perspiration. Besides, an occasional use of these processes would be of beneficial influence, for the preservation of health and vigor of many of sedentary occupations; due instruction being always given, by a suitable attendant, as to the degree and management of the process.

Although much would be added to the sanitary efficiency of these baths and wash-houses, by the arrangement alluded to, a still more valuable object would be accomplished, in Hydropathic Establishments, properly situated, and with all the requisite arrangements for carrying out the system of water treatment, but

adapted in their rate of pecuniary charges, to the circumstances of the afflicted with disease, and of limited fortune.

The physiological Water Cure would then have a more productive field for the display of its great power, in the treatment of a much greater variety of diseases. Confined as it now is, principally to the wealthy, a limited range of variety of disorders must necessarily follow. This arrangement of less charges, gave to Priessnitz a great advantage in the experience which he cultivated and enlarged into his system of treatment. That system is now placed on its legitimate basis of science,—the firm basis of physiology and pathology, and that on which must stand any system of therapeutics to be worthy of the regard of educated and intellectual men. It was by his innate talent of deductive and inductive reasoning, that he, step by step, thought out his different appliances ; and in their wise combination, he established the Water Cure. It will assuredly survive all present opposition, and will continue a boon to mankind, as long as disease shall be known amongst them, and physiology and pathology and therapeutics are known and valued in the world. His practice in the treatment of all classes of individuals from the prince to the peasant, presented to him many kinds, many shades and characters of disease. Moreover, he had these before him in their various phases, and as affected by the different processes, during the requisite length of time for their cure ; *for his patients could afford to remain, at his pecuniary charges.* He benefitted, and grew wiser in treatment, by practice. With medical education, we may suppose, that he would have further profitted by the experience he enjoyed, and which will

never be enjoyed again, until under similar combination of circumstances to those we have first alluded to,—by making the Water Cure more accessible to the many under the double trial of disease and poverty. Yet, my reader will reflect, that out of this sorest combination of human afflictions, *evils*, we misname them, would much good be derived. It is the wise, and not inscrutable arrangement of the Wisest and Best of Beings—good out of evil—to him who gives, and to him who receives:—the merciful providence of the ever blessed God, by which our misnamed evils become blessings, and are so calculated to fix our wandering affections upon Him, the only source of happiness.

To return, the Plunge Bath may be prescribed to great purpose, by the Water Cure practitioner; but as already remarked, it is only for those of his patients, who possess sufficient vigor of the nervous system, to secure the necessary reaction. It is a powerful tonic and stimulant to the whole animal frame: for this purpose, however, the patient must remain but a short time in the water; and he should occupy it in applying friction, by his hands, to the different parts of his body, in succession. Two or three minutes make the utmost limits of the duration of the cold bath, for the effect now noticed; and frequently, only one minute will suffice. I can see no great advantage to be reaped from the mode of entrance into the water, by a plunge, head foremost; and I prefer the mode of more gradual descent into it, until the lower extremities be immersed: he may then lave his face, and head, and arms, for a few moments, previously to the immersion of the whole body. We repeat, that when the tonic effects of the bath are

intended, he must carefully avoid remaining in it until the least degree of chill be experienced ; for this is the other and distinct action to be produced by its use. On issuing from the water, he should be immediately enveloped in a large coarse sheet ; and vigorous friction should be applied by himself and his bathman, in drying. He should dress quickly, and take walking exercise for, at least, an hour.

This bath is sometimes used as a *sedative* ; and it may be ranked amongst the most powerful means we possess for lowering morbid excitement ; as in cases of mania, and in the delirium of inflammatory fever. Although these are not in the class of diseased conditions under treatment at Hydropathic Establishments, it is right to specify this fact of its efficiency, and which has had repeated proof in the experience of medical men, and sometimes, undesignedly, on their part. On different occasions, have patients made their escape from those set over them ; and after long immersion, in crossing the deep waters in their way, the best effects have resulted. This has sometimes taken place in maniacal disorder, but more frequently in the delirium of fever. In hydropathic practice, the Plunge Bath has been used in cases requiring great rapidity of the chemico-vital process, *the change of tissue*. In union with other measures, it is effective in hastening the absorption and removal of redundant fat, and of unhealthy deposit of any kind. Care should be exercised, however, in the investigation of the original cause, and in estimating the organic capability ; also, that there be not present any organic disease ; as of the heart, or lungs, or brain. In all, the cases are of rare occurrence, in which it is

relied on as a principal means ; as there are others of less violent nature, and more certainly regulated, in their operation. Nevertheless, it may be, in skilful hands, and in certain cases, a valuable remedy. “*Tempestivo usu tale fiat.*” But the cold bathing at sea side, and at Watering Places, is frequently of but little benefit ; because of inattention to the necessary circumstances in connection with its proper use ; as I have already remarked.

§ XII. SPINAL WASHING.

This process was introduced at Malvern by Dr. Gully, and in consideration of the functions and connections of the spinal cord, it must be a remedy of great power. It is administered to the patient whilst seated on a board, which has been placed across a Sitz Bath, half filled with water, of proper temperature. The bathman then laves and rubs the spine, by means of a large sponge, or towel, which he constantly dips in the water beneath, so as to keep up a continual change of the application : this is continued during from five to fifteen minutes, according to the case ; the part is then dried, with due friction of a towel. The action is stimulant, and effectively remedial, in cases connected with the great nervous centre, the spinal cord ; in such also, as are reached more indirectly through its medium. I have prescribed it as an adjunctive or additional means, with satisfactory result, in *paraplegia*, or palsy of the lower part of the body. In other cases, and not of *paralytic* character, but where sensation and motion continue in their usual degree, its effect becomes more

evidently stimulant of those parts, and extends to the whole frame. This is manifested by the feelings of relief of cerebral symptoms, of heaviness and stupor, which are exchanged, by its means, for those of lightness, combined with greater alacrity and power of the limbs, and of general comfort and warmth of the surface of the body, communicated through nervous connection. The action of Spinal Washing is also propagated, by sympathy to the organic nervous centres, and to the central viscera involved in them. The organs of digestion receive the healthy stimulus, and flatulence is removed by it; and sometimes, the bowels are urged to relief, and other distressing symptoms are alleviated: the dark clouds of mental despondency are frequently dissipated, and hilarity and cheerfulness succeed them. Such effects have been repeatedly experienced, and speedily after, or even during the process. The effects of this process ally it closely with the Douche, and they are, indeed, similar, but in minor degree. Hence it is often prescribed as a precursor of that more severe process, when some doubt exists as to the patient's capability of bearing its operation. Yet we need to exercise caution in the use of Spinal Washing, so frequent, and previously unnoticed, is irritation of the spinal cord: this, too, sometimes occupies a very limited portion of it; and sometimes, it is of more subdued, or mild degree, and the application of this process serves to fully detect its existence. Again, we may occasionally ascribe the signs of irritation rather to the susceptibility of the part, under the action of the water, when used of very low temperature. By the substitution of tepid water, these symptoms cease to interfere with its appli-

cation, and they are soon alleviated, and ultimately removed. At all events, we know, that very cold Spinal Washing, if of considerable continuance, will be occasionally followed by painful aching of the spine: and sometimes, cerebral disturbance will be produced by it, and evinced by headache. It will also produce irregular spasmodic action of the muscles supplied with nerves of locomotion from the spinal cord; also of the intercostal muscles, and those of the upper extremities, when applied too long to the upper part of the spine. Hence the propriety of commencing it on the lower portion alone. I have on many occasions, conjoined the Spinal Washing with the Sitz Bath; and have ordered that the two should proceed at the same time; at other times, that the former occupy only the last two or three minutes of the latter process. With this arrangement, I have had every reason to be satisfied; but it has ever been with patients of considerable nervous power; or in those of atonic state, and where a more decidedly stimulating effect was required; and active friction had to follow the process. On the contrary, there are those, and more particularly of females, whose nervous systems are highly susceptible of the disturbing influence of Spinal Washing; and I have known the severest paroxysms of *hysteria* induced by its use. Yet, by careful adjustment of the temperature, and the time of continuance, the quite cold water has been borne, eventually, and with great benefit.

The use of Spinal Washing is indicated in atonic conditions of the animal system,—in those arising from congestion of the brain, which is often the cause of distressing hypochondriasis. In *Hysteria* of females,

so often symptomatic of irregularity of the periodical functions of the womb, it is of great service. It is occasionally of great service also, as an auxiliary means, in the excessive depression of spirits in both sexes, and having its cause in the disordered state of the stomach and liver. With these, this process will prove useful in alleviating the more urgent symptoms of lowness and *malaise*. It is usually undergone twice a day. "My experience marks it as a most useful addition to the forms of water applications, as it affords aid to the gradation of the water treatment in delicate persons; a thing which is much wanted. It is a great desideratum to have the means of increasing the power of the agents in exact uniformity with the augmenting powers of the patient." (Gully.)

§ XIII. THE HEAD BATH, AND EYE BATH, AND MINOR ABLUTIONS.

Other, and partial applications of cold water, had names given to them by Priessnitz, or his patients at Grœfenberg, according to the part of the body immersed. They had the Head Bath—the Finger Bath—the Eye Bath—and the Leg Bath &c., &c. No doubt, they were all effective in their operation. As no difficulty can exist in regard to this, or to the mode of using them; we need not enter into minute investigation respecting them.

I have often prescribed, and witnessed the best results from the Eye Bath, in ophthalmia, or inflammation of the eyes, acute and chronic: and frequently also, in states of heat and irritation of these organs, to which

this name was not strictly applicable. This process is practised by immersing the eyes, with the adjoining parts of the face and forehead, in cold water, which is in a large basin; at the same time, and alternately, they may be also laved, by means of soft linen cloth, or a fine sponge, dipped in the water. This should be continued, with the alternate immersion, until sensible relief has been obtained. As a subsequent process, it will often be necessary to apply the cold compress, composed of four or five folds of soft linen cloth, and sufficiently large to extend over both eyes, and kept in proper contact, by means of a handkerchief, bound round the head. This compress should be renewed every hour or two. But in some states of sore eyes, and in certain irritable constitutions, the fomentation with *warm water* will be found more serviceable, and a much more proper application. In these local diseases, we should never lose sight of their constitutional origin; and in the more severe kinds of them, we shall only make permanent progress of cure, by constitutional treatment. This will consist in the use of Water Cure appliances, which are most adapted for improving the condition of the digestive organs: the affection of the eyes being so often the effect of irritation of the stomach.

In the Head Bath, the patient is in the recumbent posture, and on his back, with the back part of his head immersed in cold water, which is in a large basin, or tin vessel, made for the purpose. In prescribing it, and witnessing its use, I have not seen any beneficial effects from it, which I could not produce by other, and more convenient means to the head. It becomes plain to any one of physiological knowledge, that the *cerebellum*, and

the adjoining structures cannot be exposed to the influence of cold water, for any lengthened period, as is done in holding the back part of the head in this bath, without some sensible effect being produced. I have known the patient go to sleep whilst undergoing it : and this is not to be wondered at, as it is so much favored by the posture of the body. However, he should not be left alone for any great length of time, whilst taking this bath, as undue effect might be caused on the brain.

Instances occur occasionally, in which this form of the process is advisable, and such I have met with; yet in most cases, the chief dependance ought to be placed on treatment which will correct the central, and usually the disordered organs of the nutritive function; and as palliative means only, are these partial applications to be practised.

CHAPTER III.

THE AUXILIARY MEANS OF THE WATER CURE.

Water Drinking—Diet—Light—Air and Exercise—Clothing.

§ I. WATER DRINKING.

The great object aimed at in the external appliances of the Water Cure, and through the agency of the *organic nervous power*, is the *equal distribution of the blood*. These have now been treated of; and I think, with all needful precision and plainness; keeping in mind throughout, the instruction of the non-professional reader—the Water patient:—that he may understand the nature, and be competent to appreciate the excellence of this physiological system of treatment;—that he may perceive the firm grounds for his confidence, and the best reasons for his perseverance.

We now come to those means of the Water treatment which operate more directly in securing the *healthy quality of the blood*. They are comprised in Water drinking, Diet, Light, Air, and Exercise, and Clothing. The great importance of water as a beverage, is taught by experience to every one; and it becomes more apparent, with the advantages and propriety of its internal use as a remedy, when we consider the fact, that it constitutes seven eighths of the entire composition of the human body—that it has so largely to do with all its operations, vital, chemical, and mechanical—that in a word, it cannot continue in health, nor yet in life, without an adequate supply of water. For its internal use, in aid of the external means of the Water treatment, great care and judgment are required, that it be taken in proper quantity, and at proper times, according to the present requirement. This is known to every experienced hydropathic practitioner; he also knows, that simple and wholesome as it is in health, and as usually drank, there are certain conditions of the body, in which it causes great nervous excitement, when taken in too large quantity, or at improper periods of the day. Besides these, there are occasionally strong reasons for also regulating, with equal care, its temperature.

As an essential chemical agent in the living body, water has to do as a medium, by which all its processes are performed, on which life and organization depend. By it, conjointly with the atmospheric air inhaled by the lungs, are provided the necessary conditions and materials for the *waste and repair* of the animal structure—the *chemico-vital process*, the *change of tissue*. The water, by its presence in such proportion, modifies the

composition of all the fluids of the body: it also dilutes and dissolves the solid food in the alimentary canal, and fits its nutrient principles for conveyance to all the parts of the frame. Through the same agency of solution, it becomes also the vehicle for carrying out the wasted and noxious matters. It serves to cleanse the numberless vessels, and passages, and cavities, In this useful cleansing property, in its internal and external use, it imparts great power to the Water treatment, in ridding the human body of its combined impurities.

The morning, as it is the best time for the use of the water processes, is likewise the most suitable for water drinking, whilst the patient is taking his early walk before breakfast. In many individuals, two or three tumblers of it will then act as a gentle aperient. It is ever after the morning walk, and after an early bath, that the largest quantity can be taken with the greatest benefit; and it is usually so prescribed: it is also directed to be drank slowly, and at certain intervals, so that it occupy the principal time of the morning exercise. The early morn, with its exhilarating air, and enchanting loveliness—the empty stomach—the nervous system in its most vigorous condition, after the restorative sleep of the night—the previous invigorating hydropathic process—the consecutive exercise amid the beauties of hill and dale around him, and may be, with the enlivening society of an intelligent bosom friend and companion—this combination of favorable circumstances of the patient, makes his morning water-drinking agreeable, and conduces to render it highly beneficial. We consider the due internal supply of pure water, as of highest moment, in seconding the efficient operation of the different func-

tions of the body. Its diluting and solvent properties must, necessarily, be favorable, in facilitating the elimination of all noxious matters. In this way, it favors the different depurating processes of excretion, and secretion, and aids the healthy discharge of every function of the animal organism.

Water, in its internal administration, operates on the human system by means of its temperature, and by its constituent elements,—Oxygen and Hydrogen : this is more especially, in its chemical agency already alluded to, and as evinced in the aid it affords for the *change of tissue*. Of these, its more traceable modes of action, we are confident. But, it is not to be presumed that we fully comprehend all that is really effected by it in the animal economy : neither are we acquainted with the entire remedial influences, or modes of action, of the appliances of the great Water Cure. In addition to what we are more familiar with, that of its *electric agency* may be powerful to a degree, much beyond our present calculation. The thought has often recurred to my mind, that in the operation of morbid causes, as well as in that of such as are of a remedial nature, *electricity* may participate greatly. Analogical reasons exist for the supposition, that in the derangement of normal electrical conditions, may be the *primum mobile*, the first moving cause, of many diseases ; and, that the influence of the restored normal state, may be as efficient for the restoration of health. It is allowed to hold close similarity to the nervous power ; and in some respects, no difference can be discovered between them. By this *special electric property*, am I inclined to suppose, that water acts to some extent, on the nerves, and the blood ;

and that, as a stimulant, it modifies the vital actions of the human body, as I have stated in a previous chapter.

The great physiologist of France, and the *facile princeps* of his day, was observant of the influence of this power,—he states—“ L’électricité et galvanisme manifestent sur le corps animal des effets excitans que l’on observe primitivement dans le système nerveux, et secondairement dans les tissus où les nerfs vont se terminer. Ces puissances, en effet parcourent les nerfs, et vont déterminer un surcroît de contractilité dans la fibrine de l’appareil musculaire et dans le gelatine de l’appareil vasculaire.” Broussais, Taité de Physiologie appliqué a la Pathologie., p. 40.

The internal use of water has a very beneficial and extensive influence on the entire animal frame:—on its various functions and internal processes;—on its nervous and vascular systems;—on its vital and chemical operations. Its influence is highly favorable on the great centres of animal and organic life, and on their apparatus of nerves, from their origin to their utmost peripheral extremities, or minute ramifications. Alike is its influence for good, on the entire circulation of blood, the arterial and venous, and from the centre to the circumference. Its agency becomes essential to all the chemico-vital operations on the extreme structure of the body; and its mysterious elaboration, according to the microscopic theory of cell-formation; and in which the electric power participates, or perhaps, predominates. Water, in its internal use, is powerful, beyond all other agents, for regulating the healthy and normal performance of the various functions of the internal organs; and for aiding the organic power to correct their de-

rangements. It is the great remedy of nature; and which she always seeks by unerring instinct, according to the wants to be supplied. It is a diluent and sedative under the excitement of fever and inflammations; and should be then supplied according to the demands of thirst. Again, in states of exhaustion, it becomes a grateful and innocuous stimulant. Its action on the mucous membranes, and on the blood-vessels and nerves, is most salutary, and the different viscera are brought under it, to their great benefit, according to their need; those of digestion,—the stomach, and liver, and bowels, are aided in their office, or relieved when this is disordered: whilst those of respiration and circulation,—the lungs and the heart, are soothed or stimulated, according to their condition. Water is the only means of depuration of the body; being indispensable to the secretory and excretory functions; and is ever equally necessary for all emunctory processes. It operates through its temperature, and its constituent elements, and its quality of fluidity; and by its less understood *electric* influence, as before alluded to.

In conjunction with other means of the Water Cure, it greatly favors and regulates the *change of tissue* by its abstraction of animal heat. My reader is now prepared to readily comprehend this evident fact already treated of, and the rationale of its occurrence;—that nutrition—the waste and supply of the tissues must be necessarily hastened in proportion to that abstraction, and in order to supply it. He can also conceive, that the powerful agency of water, with regulated diet, air, and exercise, will tend to stay the progress of diseased action; and of morbid deposit; that thus, redundant

and unhealthy matter will be replaced by healthy action, and healthy material : and that the establishment of perfect nutrition must secure the removal of disease, and constitute the basis of health.

The hydropathic physician takes due consideration of these properties of water, in prescribing its internal use to his patients ; and according to the requirements of the case, will be the quantity, and the stated times of taking it, with the other necessary directions in connection.

Water should be drank fresh from the spring, and during walking exercise, to secure its absorption : and a large quantity should never be taken in a short space of time, unless for some special purpose, and prescribed by the physician. It should be taken slowly, and at different intervals.

At the commencement of treatment, the water drinking should be in smaller quantities : and in certain sensitive states of the stomach, it is sometimes necessary to raise its temperature, in slight degree, for the first few days : as the patient advances in the improvement of his condition, the quantity should be increased, and the lowest temperature will be most suitable.

Whatever quantities of water may be taken internally, it never remains in the blood ; but is quickly passed off ; excepting that which may be needed for the chemical purposes of the body ; and it passes off charged with impurities, and has thus a cleansing operation.

A larger quantity should be taken in warm, than in cold weather. The patient should never drink a large quantity of water, when much heated, and fatigued by exercise.

In all fevers¹ and inflammations, and when there is dryness of the skin, the patient should be allowed any quantity of water he may desire, contrary to the absurd ideas of many attendants on him, as I have repeatedly witnessed : the thirst itself is the strongest indication of the wants of his system.

There are ever circumstances which modify the water drinking under the water treatment, and which should be decided by the judgment of the physician :—the constitution, and the nature of the case—the age, and previous habits.

The effect of cold water on the stomach, is rapidly transmitted to the brain ; so that, in irritable states of the animal nervous system, it is necessary to take due consideration of this ; and only to prescribe it in smaller, and graduated quantities, and not of the extreme degree of coldness.

When taken in proper quantity, it greatly sustains the power of the animal nerves ; and hence, it is of such decided influence in frequently enabling the patient to take a long walk before breakfast, when he would be quite incapable of the exercise without it.

With these cautions, respecting the quantity, and time, and temperature of water, in its internal use, we have to state, that we meet with frequent cases of torpidity of the internal functions of the body, with their partial obstruction, in which it ought to be taken in large quantity ; commencing with a smaller measure, and gradually increasing to the maximum : and this, occasionally, to the amount of several pints during the day.

§ II. DIET.

The subject of diet, in its regulation for remedial purposes, belongs not exclusively to the Water Cure ; but ought to be considered of essential moment by the scientific practitioners of other systems. Although to the uneducated mind of Priessnitz, it appeared of secondary importance, by every competent hydropathic practitioner now, the necessary directions are given to patients respecting it ; and this is very properly considered as indispensable to successful treatment. "He thought, that by excluding intoxicating drinks, and a weak cup of tea or coffee from his table, and his own diet, that he had done everything." (Wilson.)

His mind was chiefly occupied in his firm reliance on the remedial power of water ; and that power had proved so successful in his hands, that he thought it irresistible against all curable diseases, under almost any circumstances ; and in his confidence, he thought not of conditions or collaterals, beyond air and exercise. His ignorance of physiology, was no doubt, the ground of his disregard of diet.

The subject is deeply interesting, and sufficiently extensive to occupy a separate treatise ; and such have been repeatedly composed by talented authors of the profession. It will suffice for our purpose, that we consider so much of it as is more directly concerned in water treatment. In this there is ever urgent need of its regulation. The tendency of all its appliances is to increase the appetite, and the digestive power ; and in many of those instances in which this augmentation is greatest, and restraint becomes most difficult, the

appropriate regulation of diet is most necessary; and this, particularly in regard to *quantity*; at the same time, the matter of *quality* of food must be attended to. Often have I endeavoured to convince my patients of the correctness of this statement, in connection with the physiological fact it rests on;—that, while the animal frame is under the influence of spare diet, and unsatisfied appetite for food, its absorbent system is in an active state, and other functions are also in the most favorable condition to aid that system in the removal of any morbid matters; and through the additional agency of water treatment, to aid also the restorative power of the body for the re-establishment of health.

In the treatment of stomach complaints, attention to diet is imperatively required, that any progress may be made in recovery. Much as the proper processes avail in these cases, errors in diet, either as to *quantity* or *quality*, will effectually counteract the good effects produced by them. The nature of the disorder will, of course, dictate as to the particular caution to be used. In some instances of dyspepsia, the stomach will do best with more stimulating food, which is of nutritious kind, as mutton, or beef, or bread. Again, in other instances, such food is improper, and that of a vegetable nature, and less nutritious, and less stimulating, will be most suitable. The question of the *quantity* requires the consideration of the hydropathic practitioner; and it will demand, on his part, skill, and determination also, to direct the patient;—firmness of purpose, to enforce obedience. Without these qualifications, his practice will frequently disappoint him; so frequently do patients stultify themselves, in deceiving him. As just observed,

the processes tend much, in their operation, to increase the appetite; and in such degree, that considerable stocial resolution will be necessary on the part of the invalid, and every encouragement from his physician. Often have I also pointed out to the dyspeptic, the dictate of common sense, that the stomach surely requires allowance of rest, and with as little of digestive work as possible, in consistence with the wellbeing of the body, and the exertions it may have to undergo, on the consideration, that when it is disabled by disease, for the proper performance of its function, *rest* must be a necessary condition of its *self-restoration*.

In the practice of the Water Cure, as well as amongst those of other systems, some difference of opinion occasionally arises in regard to the regulation of diet, under the treatment of disease; and some difference also, amongst authors, and professional theorists, relative to that which is most wholesome in health. Before we refer to its management in hydropathic practice, we will take a cursory glance at such parts of the subject as we deem most interesting to our reader, the Water patient: referring him, for more extensive information, to the larger treatises which have been published.

What is the best adaptation of diet to the various and ever varying external conditions of man, has been often a matter of speculative opinion amongst physicians and philosophers. Under the different circumstances of climate, and habits, human beings exist in health, whilst living on food of every kind of animals and vegetables. Fruits and roots constitute the diet of some, whilst flesh of every description, and cooked, and raw, is as exclusively that of others. Again, others make use of

both kinds, and live on a mixed diet, animal and vegetable: all these are duly fed, and healthy; and although, perhaps, not equal in physical strength, nor in mental capability, they are equally sustained in fitness for the purposes of life, which their peculiar circumstances require. It is established by experience, that man is omnivorous—an eater of all kinds of food. We scarcely need refer our reader to the various examples:—The Esquimaux of the arctic regions, who feasts on whale blubber, and on the morse, or sea horse;—the inhabitants of tropical climates, who eat only the vegetable productions of their country;—the various savage tribes of man inhabiting different, and distant parts of the world, and devouring their food of either animal or vegetable nature, according to their means, and opportunities of procuring it. Amid the different classes and characters of civilized mankind, we find great extremes in respect of the quality of diet, and even in the same country, and varied by the collateral circumstances of individuals. The great inference to be drawn from these considerations is, of the adaptability of the digestive function, and of the constitution, to the necessities of life.

It is sufficiently established by experience, that although mankind are able to subsist upon great variety of food, it is most rarely that they can bear a sudden transition,—a sudden change from one kind, to another and opposite one. This has been repeatedly proved by the evil consequences arising from it. In the east of France in 1817, the sudden adoption of more liberal diet, after a partial famine amongst the poor, occasioned by a failure of the crops, was the evident cause of severe

diseases. We are also informed by Avicenna, an Arabian philosopher and physician, that spare living is most suitable after fasting ; and he relates, that after a famine in the city of Bokar, a great number of men and women, who had remained in health on roots and herbs, were attacked with severe diseases, on resuming a full diet of flesh and bread. Many instances might be advanced, in confirmation of the point we are treating of, and of frequent occurrence amongst ourselves. These are noticed by Dr. Paris, in his work on diet. Care should be taken, in our change from one extreme of spare food, to another of more nutritious kind ; and in regard to both *quantity* and *quality* ; for it should be gradually accomplished.

Further, by a gradual management of the food of birds and quadrupeds, extraordinary changes have been ultimately effected. Spallanzani proved, many years since, that animals may be brought to live on food of a kind directly opposite to that of nature : that the eagle may be kept on bread, and the pigeon on flesh. It is known also, that horses are frequently fed on fish, in certain maritime districts in the east. And on the coast of Coromandel, on boiled flesh mixed with their corn. Sheep, even, have been fed with flesh, until they refused the grass of the green mountain, and meadow. There are authentic records of these facts.

Whatever be the food taken and digested, from it alone is formed the blood : and it is therefore inferred, that that the several kinds of it differ only in the quantity and form of nutriment they contain. In animal food, subjected to the digestive process, little else than minute division is required : but in the vegetable kind, different

decompositions and recompositions are necessary, in order to reduce it to a proper degree of assimilation, for nourishing the body. Yet it is well ascertained, that the former gives rise to a higher degree of excitement; and the latter, with the greater and necessary alimentary changes, gives less. This fact is ever remembered by the physician, in respect of animal food,—that whilst it is more nutritious, it is more stimulating,—that it affords a more animalized *chyle*, and at same time, a more powerful stimulus to the alimentary nerves by its contact. In hot countries therefore, and in hot summer weather of our own, we instinctively make choice of vegetable food; as do, also, the people of tropical climates. On the contrary, and by instinctive choice, we prefer animal food, and of strong quality, in winter; as do the inhabitants of more nothern and colder countries, an almost exclusively animal diet. These natural, or instinctive tastes, serve the wise purpose of giving physical power to resist the influence of cold, and also to sustain bodily exertion. The due proportions of animal and vegetable diet, are always to be regulated according to the same rule in medical practice!—the exertions to be undergone, and the state of the constitution, are to be considered.

In the Water Cure, we have also to consider the amount of treatment, and this is one of the principal circumstances. The operation of the different processes, and in various degrees, makes a demand for a certain quantity and quality of food to the animal system; that the nervous energy be roused for the reaction, and for alimentary supply to the accelerated chemico-vital process—the *change of tissue*. Hence the need of proper

consideration for a correct adjustment of diet: often has this been impressed on my mind by experience,—that a certain proportion of animal food is necessary for the patient whilst under *full treatment*, as we term it in its greatest extent: whilst he is, to such extent, undergoing the invigorating, and tissue-consuming processes of the Water Cure, with exercise in the open mountain air. If the needful proportion of food be withheld from the system at such time, the consequence is soon seen in the inability of the patient to endure, as heretofore, the reduced temperature of his baths; and even a dislike of those which he previously enjoyed, will ere long be produced; and the exhilarating influence of the reaction will no longer be experienced as before. This I have experienced personally, in practical investigation of the subject. The error of diet, however, is usually on the other side. The provision of food, at Hydropathic Establishments, is rather in excess; but I believe, that more cures, and in less time, would take place, under a more stringent regulation. Too much is usually provided at the table, and in too great variety; and the water patient, being urged by an increased appetite, and a stronger relish for animal food, and withal, under the stimulus of agreeable society, he listens too readily to the silent whisper of his sense of taste, and the craving of an active stomach, which soon persuades him that “might is right,” in this application of the term. Yet, the power of the digestive function to dispose of food is, by no means, a rule for indulgence. As pointed to before, this increased energy of the digestive organs is in many cases, a reason for determined abstinence, in proper

degree; that it may be rather exercised in its agency against morbid matters yet in the body, and requiring removal, as a condition of health. In accordance with the statements of Dr. Ed. Johnson in his work on Hydropathy, "under the influence of a scanty diet, and upon the principle that oxygen will unite first with such matters only as are least essential to life, it is clear that if there be in the system any morbid matters, the oxygen will unite first with these, and carry them off through the lungs, skin, and kidneys, in the form of compounds of oxygen. It will unite with the morbid matters first because they are obviously not at all essential to life. These morbid matters can often be detected readily enough in the urine, breath, perspiration &c," and again, "I have seen the most astonishing effects produced by a judicious union of the Water Cure, with a rigorous diet—the effect of which is, to excite what is called *compulsory absorption*. The principle on which compulsory absorption is founded, is that well known law of nature that when the supply of food is *diminished*, the absorbents are *compelled* to make up the deficiency by seizing upon all such matters as are useless in the living economy. In this way, morbid matters which are present in the system, are taken up and finally carried out of the body, by the excreting organs." This interesting subject is also correctly treated by Drs. Wilson and Gully—and the celebrated Liebig gives very lucid explanation of it in his work on *animal chemistry*.

It is an impression on my mind, that all that has been hitherto achieved in this way, is of but trifling amount, in comparison with what might be done, through the united efficacy of these two mighty curative agents,—

abstinence and the Water Cure, judiciously united, cautiously and skilfully directed, and resolutely followed out by the water patient. Most confident am I, that much can be accomplished by this union, which cannot be done by any, and all other known remedies, and I suspect that this physiological method is not sufficiently practised by us. The influence of previous luxurious habits of life greatly incapacitates many patients for the exercise of that firmness of resolve, which is ever so invaluable, as an aid to the skill and judgment of the hydropathic physician. So often have I witnessed the cases called *failures*, by patients and their friends, which were to be entirely imputed to themselves, rather than to the physician, or to the Water Cure: and they would have been more correctly termed,—instances of the insurmountable love of luxury, and indecision of the patients.

On the *comparative digestibility* of the different kinds of food, much mistake and controversy have taken place amongst writers on the subject. This has arisen from indistinct ideas of the term, and from erroneous experiments, and inattention to the circumstances by which digestion is hastened, or retarded. We should err in supposing that the degree of digestibility is to be reckoned according to *the time the food takes in its passage through the stomach*. For it is ascertained, that on the principle of *organic instinct*, the stomach soonest passes forward those substances, which afford little nutriment, and are naturally indigestible. The late Sir Astley Cooper made his experiments on dogs, to decide the comparative digestibility of certain kinds of food; and inferred erroneously, that pork is more digestible than

beef, because it passed in less time through the stomach. And Dr. Banmont, of America, in the San Martin case, makes a mistake on this point also, supposing that *gelatine* is very digestible, because it passed through in an hour. To his conclusion, however, are opposed the experiments of Tiedemaun and Imelin and Blondlet. Again, Trousseau contends, that the digestibility of food consists in the relation of its nature to that of the gastric juice, in rapidly and easily yielding its nutrient elements. This may be considered the most correct idea ; for it expresses the existing relation between the nature of the food, and the condition of the stomach, in the power of the secretions and actions, at the time. This relative condition of the stomach must vary much, and it is one great object of medical treatment, and of regulated diet, to diminish this variation;—that the same kind of wholesome food may be uniformly suitable, and always call forth the healthy action of the organ, for its digestion. There are certain necessary conditions of alimentary substances, which affect their digestibility ; and these should be considered, that too meddling art, by catering to the vitiated palate, may not interfere with the natural adaptation of our food to the varying conditions and circumstances of life. Of these conditions of food, a primary one is that of its natural, and original form, and constitution, as far as possible. Again, that there is the admixture of a certain quantity of excrementitious, or non-nutrient matter, which is as a diluting vehicle of the properly nutrient part. Again, we find in the composition of food, a stimulating and aromatic principle, calculated to act on the stomach, in promoting the digestion ; and to gratify the sense of

taste and smell. This principle is in foods of all kinds, animal, and vegetable. It is in flesh of beasts and birds, and fishes, and gives the flavor, which is so much thought of. It is the *osmazome* (οσμη odor, and ζυμος juice) the name given by the scientific to the extractive matter of muscular fibre, and which gives the peculiar odor to roasted or boiled meat, and the flavor to broth, and soup. This *osmazome* is a valuable element of cooked animal food, and is, indeed, essential to its digestibility. The *aroma* of flour is an analogous principle, and is confined to the bran: hence the superiority, in some respects, of brown, to white bread; as the latter is deprived of its *aroma* or *quasi, osmazome*, with the bran. There is a well known difference in the digestibility of different kinds of wholesome foods. Vegetables, that are not converted into bread, are of less easy digestion than flesh, and the *farinaceæ*. (Farina, flour or meal.) Any food that is of less digestibility, and eaten in less quantity, is, in proportion, more quickly passed through the stomach, as said before, by the *organic instinct*. It is well known, that crude vegetables pass more rapidly through the healthy stomach, than do other kinds of aliment, as mutton, or beef, or bread. It is also established, that the *gratefulness* of food aids much in its digestion, and this makes the art of cooking of such advantage, in improving the quality in this respect.

Various accounts have been given by different authors, on the *relative digestibility* of the many articles of diet made use of in civilized life: yet, in a certain extent only, can they be applied to useful purposes; so varying are the conditions of every individual, and so many the circumstances affecting them. The entire subject of

digestion was very industriously experimented on by Dr. Beaumont, in the case of San Martin ; and he has thus become an authority, frequently referred to, on the function of the stomach. However, it does not appear, that he proceeded with much philosophical accuracy ; and his conclusions must be taken with the modifying circumstances in connection. On the subject of digestibility of food, we have ever to consider the state of the mind, as well as that of the body. Also the peculiarities of constitution ; the degree of appetite, and the length of the previous fast. Again, the amount of exercise, and the state of the absorbent system, or as it may have been affected by previous evacuations. Again, the quantity, and the quality of the meal taken ; and the habits of the individual, both before, and after it.

With regard to the *nutritive power* of alimentary substances, there are very indefinite and imperfect ideas in the world. It consists of the amount of material in food, which can be converted into *chyle*. And for this, they must, of necessity, contain *Nitrogen*, and certain *earthy salts*. It is to the different proportions of these, in animal and vegetable aliments, that they owe their different degrees of *nutritive power*. Nitrogen is the principal distinguishing element of food. The continued existence of the human body requires the daily supply of as much organic *nitrogenized matter*, and of *earthy salts*, as are expended in its incessant waste. This supply is afforded by digestion of food. Thus the elementary substances which most abundantly contain *Nitrogen*, and in combination with these salts, are the essential basis of food. The fundamental *nitrogenous principles* are *Fibrine*, *Albumen*, *Gluten*,

and *Casein*. Our daily food, in which they abound are *Flesh, Bread, Eggs, Fruits, Grains, and Roots*. The nutritive power depends on the amount of *nitrogenized matter*, and *earthy salts*; its power of supplying the daily and hourly *waste of tissues*.

The learned Liebig is now the highest authority on the very interesting subject of diet. We see by the lucid experiments he has made in animal chemistry, that all the constituent elements of animal bodies are contained in vegetable substances.

That the vegetable kingdom is indeed the primary laboratory, in which are formed these elements from earth and air. Most pregnant with materials of deep and devout reflection, is the subject, on the infinite wisdom, and goodness of the Supreme Being.

Liebig classifies the substances of diet according to their nature, and the purposes they serve in the animal economy. His words are "Out of those substances which are adapted to the formation of blood are formed all the organized tissues. The other class of substances in the normal state of health, serve to support the process of respiration. The former may be called the *plastic elements of nutrition*; the latter the *elements of respiration*.

Among the former we reckon *Vegetable Fibrine—Vegetable Albumen. Vegetable Caseine. Animal Flesh—Animal Blood*.

Among the elements of respiration in our food are *Fat—Starch—Gum—Cane Sugar—Grape Sugar—Sugar of Milk—Pectine—Bassorine—Wine—Beer—Spirits*.

But the limits of this volume will not permit us to proceed further on the subject, and we must refer the reader to Liebig's excellent work, on "*Animal Chemis-*

try in its application to Physiology and Pathology."

In the practice of the Water Cure, the regulation of diet must ever be according to the varying circumstances of the case. The principle of moderation will be applicable to every diseased condition of the body, which will be presented for treatment. The quantity of each meal should always be short of that which would create a sense of oppression, either of the mind or body. In dietetic management, we should never lose sight of the physiological law in respect of the alimentary canal, and the function of digestion ;—That no two actions can be continued within its limits at the same moment, without interference with each other. For perfect performance of the process of digestion, it alone must be going on. Hence irritation of the bowels will interfere with the action of the stomach. On this principle or law, is the necessity for the regulation of meal hours ; and this should be according to the occupation of the intermediate time, and the power of the digestive organs. In Water treatment at Establishments, the day is so occupied, in the different processes, and the adjunctive means of exercise in the mountain air, that the breakfast is usually at 8 o'clock a. m.; the dinner at 2 p. m.; and the last meal, of tea or supper, at 7 p. m. This is a suitable arrangement, and well adapted to the treatment. No food is allowed during the intervals of meal times. These intervals are taken up in the processes, and water drinking, and exercise. The six hours intervening, become the fixed period for the perfect digestion of the previous meal, before the succeeding one ; and twelve hours intervene from the last meal to the first, six of which are supposed to be occupied in sleep. This

appears an excellent regulation, and rarely is there occasion for any divergence from it. It may interest some readers, and I therefore specify further, that the breakfast is composed of Bread, white and brown, with fresh butter;—Water, pure and sparkling from the spring,—Also Milk—Cocoa—and weak black Tea :—occasionally, there are cases under treatment, requiring the addition of a slice of cold meat, or an egg. The Dinner consists of a larger and more varying assortment of viands ; but they are always of the most wholesome kind. Roast Mutton is always on the table at this meal, it being considered the most wholesome of animal food ; —Beef—Fowls—Game, occasionally,—and certain kinds of Fish, which are of allowed quality for patients—Cod—Soles—Turbot—Haddock. Of Vegetables, there are Potatoes—Rice—Cabbage—Cauliflower—Spinach—Asparagus ; also Peas and Beans—Carrots and Turnips. Of Condiments, the only kinds allowed, and proper, are Salt—Sugar and Vinegar ; the last is allowed only with Fish. Of Puddings, are those of Bread—Flour—Rice—Sago—Semouli. For Drink,—Water. The Tea or Supper meal, is same as Breakfast, only my reader, the water patient, must remember, that the difference in the hour of the day, in which it is taken, should make a difference in the quantity. It should be more spare. Let him also remember, that any feeling of fatigue, from the labors of the day, is to be removed by *sleep*. It is an absurd idea of many, that a heavy meal becomes necessary in such conditions of the body, in the evening ; not so however ; food is strictly and primarily, for the purpose of supply of the waste of the system, and *sleep* alone, for the restoration of the nervous power.

"Sleep, that knits up the ravell'd sleave of care,
The death of each day's life, sore labor's bath,
Balm of hurt minds, great nature's second course,
Chief nourisher in life's feast."

SHAKESPEARE.

Having thus glanced at the principal kinds of food used at those institutions, which will, at a future day, be justly regarded as amongst the most beneficial of the world,—Hydropathic Establishments, we need not particularize further; for I have already gone to the utmost limits on this subject, consistent with the professed character of my book. I have treated mainly of general principles; and particular cases in practice will ever require their modifications which cannot be stated here. To conclude, and it will be of useful purpose, just to state the names of the principal articles of food, which, although of common use amongst the healthy and robust of mankind, are in the catalogue of the forbidden and unwholesome, for the Water patient. Of these we mention all kinds of Fish abounding in oily matter, or having a texture and quality unsuitable for the stomach of the invalid: such are Eels, and Salmon, and Herrings, and Sprats, and Mackerel;—also all salted, or pickled Fish; and all shell Fish. Of Fowls, we also prohibit the use of Geese, and Ducks, and all smoked, and dried flesh,—Sausages of all kinds,—also Cheese—and Honey. Of Vegetables and Roots, are forbidden,—Celery—and Sallads—Water Cresses—Mustard and Cresses—Cucumbers, and Onions, &c., &c.

Condiments of all kinds are prohibited in the diet of Water patients—Mustard and Peppers of all kinds,—Cayenne, Ginger, and Mace, and Nutmeg, and Cloves, and Cinnamon;—also Horseradish, and all Sauces for

Fish, or Game, as prepared and sold—Catsup, and Pickles of every description, and Pastry—Preserves, and Cream—Nuts, and Almonds ;—and all kinds of beverage, but those of Water and Milk—all Spirituous, and Vinous, and Malt-liquors ;—also Coffee, and green Tea, and black Tea of strong infusion.

I have just to add in concluding this very important subject of diet, and because of its importance, that the Water patient in respect of its regulation, should resolutely obey the directions of his physician ; and not, in any degree, or manner, to indulge his taste or appetite at the expense of his health. When at his meals, he should eat slowly, and be careful to secure the perfect mastication of his food. Let him also remember, that it will always be advisable, that he finish his exercise an hour before meal time ; and that he do not sit down to it in a state of fatigue, or great heat of body. He should have an hour of previous rest. Neither liquid nor solid food should ever be taken hot, or of a high temperature, into the stomach. It is very injurious to the nervous system, and I have repeatedly traced to it the cause of the most intractable kinds of dyspepsia. The patient will do wisely in taking food of all kinds as cold as can be.

§ III. LIGHT.

Light is a very important agent for the health and well-being of man, and ever exercises a powerful influence on his mind and body : great is its action on living animal matter, as well as on that of vegetable nature. It is well known how great is the action of the sun's rays upon color, giving a much deeper tint to the

exposed parts of both animals and vegetables. The effect on flowers, and on the plumage of birds, in tropical climates, is remarkable, and ever distinguished by brilliancy, and depth, and beauty. The skins of men inhabiting such countries, become darker, and coarser, and harder : and a wise and beneficent arrangement is seen, between the effects of heat, and those of light;—those of the latter being preventive of excessive perspiration and relaxation, so liable to occur from those of the former. Light also augments the tension and solidity of the muscular fibre; and because of this circumstance, a person will sweat more in the shade, than when exposed to the full rays of the sun. Hence also, the labouring man, compared with others, is as hardy and strong in tropical climates, as he is in the more temperate countries. We need, for illustration of this, to regard, and compare the luxurious Mandarin of China, with the hardy Arab of the desert.

The evil effects of deficiency of light are made manifest, in becoming the cause of disease in the human body; and they have been long observed by medical men. They have much to do, in union with other causes, in the production of Scrofula; and in increasing the disease, when of hereditary origin; as in those of the lower orders, in narrow streets; likewise in those, who are much confined in manufactories, and in other places of darkness. Humbolt and Edwards have gone further; but, on insufficient grounds, have stated, that deformity of the human frame is a consequence of deficiency of light; and the contrary, that symmetry and beauty of form, are the effects of the habits of savage life, in being without clothing, and in the full exposure

of the entire body to the light of the tropical sun. No doubt, such exposure, and liberty of limbs, with other cognate causes, will favor the development of the body in its just and elegant proportions: but, other influences are in constant operation amongst savage tribes, for the prevention, or exclusion of deformity in individuals:—Those of them who may be congenitally malformed, or of weak and unhealthy frame, have but small chance of arriving at mature age, because of the severe trials of such way of life; and such malformed children are but seldom allowed any chance of it, because they are usually destroyed in infancy, to prevent the care and incumbrance of rearing them.

Again, we have to consider, that light not only becomes a stimulant and tonic, by its rays upon the surface of the body, but also in its application to the eye itself. This most interesting organ possesses its own special irritability to the action of light, as others of the body have each their own, also, to the particular stimulus of their functions, as we noticed in the preliminary part of this treatise,—the heart, to that of the blood—the stomach, to food—the lungs, to the atmospheric air—the bladder, and the bowels to their contents. But the eye may be regarded as of more extensive and general influence in its office, and it stands in intimate relation to the mind and body of man. It is the inlet of the soul from the external world, and becomes also, the most expressive feature and index of what is going on in the world within us. It beams with joy and loveliness when there is the sunshine of peace and love in the heart: and poets tell of—a laughing eye—a speaking eye—a pensive eye—a wrathful eye, and so on. It becomes,

also, the intelligible interpreter of the mind, and is, moreover, the keen scrutinizer of the thoughts and feelings of our fellow mortals towards ourselves. How often have I thought—what artist's skill could have truly depicted the piercing glance of the ever blessed Jesus, by which he smote the cowardly apostle, and sent him from his presence, to go out and weep bitterly! "And the Lord turned, and *looked upon Peter*. And Peter remembered the word of the Lord, how he had said unto him, Before the cock crow, thou shalt deny me thrice. *And Peter went out and wept bitterly.*" LUKE 22., lxi., 62. That look from that eye was, indeed, eloquent, and impressive in the extreme; and yet without anger, it proved all-subduing to the heart of Peter, in the chastisement of divine love.

Because of the eye being the connecting medium between us and what is external to us, it is easily conceived how powerful may become the light, through which its function is performed; and it is found in the experience of all, that it is a very powerful stimulus to the whole system of man—mind and body. This is well known to us all, in the effect which is produced on the spirits and health, by bright and sunshine weather: and in the contrary influence, of clouds, and fogs, and gloom.

The influence of light is properly looked to, by medical practitioners, in diseases of the eyes, in which it becomes necessary to exclude it entirely. But it is not less necessary, also in other and more general affections of the system. Hence, the darkened chamber, in every acute illness,—in fever,—and especially, in all affections of the brain.

It is a striking circumstance in the statistics of

mortality, that many more deaths take place during the night season, than during the day. We are informed by Fourtere, that nearly one third more deaths occur in the night : and it is accounted for, on the ground, that the animal frame, then weakened in the grasp of death, and without every, and the slightest stimulus, and deprived, also, of that of the light, more readily sinks into the sleep of death.

It is an impression on my mind, that this subject of light, in its hygienic agency, and in connection with the Water Cure, has not had that attention bestowed on it, in hydropathic publications, which its great importance claims for it. Assuredly, it has very much to do in the beneficial influence of mountain walks, in union with air and exercise : and if any choice is to be decided on, as to the most favorable season of the year for Water Cure treatment, I should fix on the spring and autumn months, in preference even to winter ; only because of the greater length of daylight at those times. Although the cold of winter so much augments the power of the water treatment, the great advantage is overbalanced by the advantages of longer days and shorter nights. Besides, in the long winter evenings, it becomes almost impossible to avoid the in-door habits of the drawing room, which, however agreeable for promoting sociable intercourse, are not so much adapted for seconding the influence of the water processes, and for invigorating the health.

§ IV. AIR AND EXERCISE.

But few words are required in advocacy of air and exercise, as means of health ; for, by universal experi-

ence, their value and importance are established. In every system of Hygiène, and of curing many diseases, they are properly deemed of very great power. They are equally valuable and important in the Water treatment: but in it, they stand in a more special relation, and their mode of action on the human body is scientifically considered, and is in strict accordance with that of its other means of cure, diet, and the water appliances. The requirements of each case under treatment constitute the rule of apportioning them.

Pure atmospheric air is requisite for all; yet, there is need of some caution in respect of its temperature, and its degree of moisture, or other qualities: as we find in the east wind, and night air, for those labouring under Asthma; and especially, for the sensitive neuralgic patient, is there need of regulating his exposure at the commencement of treatment. With these principal exceptions, and other possible ones, the water patient will be most frequently directed by his physician, to live as much as possible in the mountain breeze. The benefit of this, however, will be best considered in connection with the accompanying exercise of walking.

Great mistakes have been committed by some non-professional writers, and practitioners of the Water Cure some years ago, in regard to walking exercise for invalids; and for those long accustomed to previous indoor life; and in total disregard of the state of the nervous system at the time. We could relate some striking instances of severe indisposition, brought on entirely by severe walking exercise, whilst the animal system was, in reality, unfit for it. In the practice of Hydropathy, also, much harm may be done through ignorance of the capability of the patient.

The kind, and extent of exercise for the Water patient, must always depend on many circumstances:—the stage of the treatment;—and the water processes he undergoes:—moreover, it will have to be regulated, as to the time of the day, for which these may be separately arranged:—also according to the diet, which may be prescribed; in a word,—according to the case. This may also require horse exercise, rather than that of walking; or it may require carriage exercise, in preference to either.

The power which is called into action in walking, is supplied for the purpose, from the brain and the spinal cord, the seat of the will. We remark again, how replete with interest is this physiological fact! Besides this, however, there is a connection with the nerves of organic life. The whole is interesting, in explaining the influence of walking exercise on the mind, as well as on the body. How often has the depressed and care worn had his burden lightened by the walk, with agreeable accompaniment, on the mountain's side, or, "in those fair vales, by nature form'd to please!" We see the need of the mind's participation in it, in order to reap the full benefit;—that those exercises which the mind enjoys, do most good:—and this extends, also, to the organic life. The walking exercise should be regulated according to the condition of the great centres of animal life,—the brain and the spinal cord. If that condition be one of irritation, and incapability for the exercise, these will be increased by it. Such condition ever accompanies that species of stomach complaint indicated by the clean and red tongue, and having fissures on its surface in various directions; and with other symptoms,

the appetite often remains good, or rather voracious: and the mind is changeable, and impatient, and fretful. In this species, called *nervous dyspepsia*, much walking exercise would be decidedly harmful. Many individuals entertain the very erroneous idea, that it is beneficial in the treatment of all cases of dyspepsia, or stomach disorder: and much injury has been caused to such, by junior practitioners, through their want of discrimination between those really requiring it, and the others requiring a measure of repose, with the needful treatment. That extent of exercise which may be enjoined with propriety, in nervous dyspepsia, will be principally such as is necessary after each water process; and, in many instances of the kind, moderate riding, or driving, will be the most suitable: however, each modification of disorder has to be managed as its indications may be to the intelligence and skill of the physician. The thought has repeatedly come to my mind, that of the thousands of cases presented to Priessnitz, many must have been unsuitable for either the diet, or the mountain walking at Groefenberg: that much time was lost in their treatment; and, necessarily, much needless suffering endured. However, we owe much to the man, and to the firmness with which he grasped those few correct principles he thought out and held, under such great disadvantages. Honor to his name!

In hydropathic treatment, air and exercise properly regulated, are powerfully adjuvant, or auxiliary, to the water processes. Their mode of action on the human body, is in exact unison with, and greatly increases, the influence of these; and they co-operate to the great purpose of restoring and exalting *the power of the living*

organism, by which alone, all diseases are cured. Be it remembered by my reader, that these, the means and appliances of the Water Cure, are the most natural and effectual; being for the healthy performance of the natural functions of the body; and particularly for those of *waste and repair*—of secretion and excretion—the incessant *change of tissue*.

The remarks we have hitherto made on air and exercise, are mainly of a cautionary kind—against hurtful excess of the latter; and, no doubt, much evil has occurred to patients through their own, or their adviser's want of due caution on the subject. Yet, it is my conviction, from ample opportunity of knowing, that much, very much advantage and benefit are frequently forfeited by Water patients, through their great fault in the opposite direction—in deficiency of exercise. Certainly many are the cases, in which air and exercise, from first to last of the treatment, and to great extent, are the chief conditions of progress in the cure: in which, the benefit to be derived from the water processes, will depend on the resolution of the patient, in obeying the injunctions of his physician, and in walking on the hills, and in inhaling the pure and invigorating air which is there. This should not require much persuasion, except, perhaps, to the thorough hypochondriac, who has escaped from the murky atmosphere of the crowded city, and whose depressing ailment has clothed all places and things with the ideal sombre covering of his own thoughts and sufferings. He has a strong claim to our sympathy, and he usually meets with it at Hydropathic Establishments. In warning on the impropriety of much walking in certain cases, I mentioned that of *nervous dys-*

pepsia, with the clean red tongue, and irritated brain, with other symptoms we need not repeat. There is another kind of stomach disorder, however, and in which lowness of spirits, and great irresolution of mind, prevail; and in which the liver is usually disordered. With the suitable water processes, air and exercise in walking, in this complaint, become invaluable and indispensable. It is gratifying to find, how soon the heavy burden of disease and misery, becomes gradually, and sensibly lighter, under the sympathy and encouragement, and skilful direction of the physician, and the summoned resolution of the patient. As the burden of physical and mental depression becomes lighter, so, of course, obedience becomes more easy, and more cheerful. The processes which had, at first, to be regulated in temperature, and extent, are now enjoyed quite cold, and as required, in every respect. Withal, the mountain ramble, in the mountain breeze, becomes luxurious. These cases of *mucous dyspepsia*, with more or less of liver and other disorder, are very much benefitted by Water treatment, with air and exercise. It must be also confessed, that they are often but partially relieved by drug treatment at home. We need not specify the reasons, for they must be evident to all who have any knowledge of their nature. Every circumstance in connection with the Water Cure becomes remedial, and highly advantageous to such patients: another great consideration is, that they learn in their experience of it, how to prevent any recurrence of their ailment.

Many other diseased conditions of the human body require, in their treatment by water, also a great, but ever regulated extent of air and exercise. In the last

stages of treatment, these are usually the most requisite. On the recovery of the great blessing of health, they constitute the chief means for its preservation..

§ V. CLOTHING.

Much has been written, and much controversy has taken place, on this subject.—Whilst some have contended, that clothing is merely an injurious appendage of civilized life, others have insisted, that in this country at least, the body should always be encased in flannel, and with other warm upper covering, to boot. We leave the question, at present, in its general relation, to treat of it as usually found in our patients; and as it ought to be, when under Water treatment.

It is certainly an important consideration, and especially in connection with the state of the skin. The great aim of the Hydropathic practitioner, and most frequently required, will be to derive the blood from the internal to the external parts of the body: internal congestion of central organs being the most frequent condition of disease, we aim at the restoration of the healthy functions of the skin. We act on it directly, by our Water processes, to give it normal and healthy activity, and due circulation of blood; and our means of cure are regulated to the capability of the organism. By the repetition of the applications, with the other means, the tone of the cutaneous structure is made permanent, to secure proper reaction. Whatever may have been the clothing of the patient before treatment, he will not require so much of it, when this needful tone of the skin is established.

Much clothing, and especially of flannel, tends to diminish the tone of the skin ; and thus, to render the body more liable to internal congestion. Some caution, however, is necessary, at the commencement of Water treatment, in respect of laying aside the flannels, which have been long worn : and the question of what amount of clothing is to be continued, will be decided by the nature of the case. There are certain considerations to be taken ; and that of the *waste and repair* of the body—the *change of tissue*, is an important one, as a principal proportion of it is accomplished through the functions of the skin ; and for its due performance, there must be contact with the atmospheric air. We see, then, that undue covering would interfere with this important process, and should be avoided to all possible extent. My reader must also consider, that this interruption of the skin's action, must throw on other organs, what belonged to itself to perform. A due circulation of its blood is required ; and for this, the greatest benefit is derived from the repetition of the water processes ; and by which is effected the improved tone of the highly organized skin ; all proper care being taken as to clothing : for an excess of it would continually counteract the good effects of the processes, whilst its diminished quantity would co-operate with them.

The brain and spinal cord have their nervous periphery, or extreme external branches of sentient nerves, spread in myriads on the skin ; and they thereby become liable to disturbance and irritation, if its blood be in deficient quantity, and it do not react duly on atmospheric changes. Be it remembered by my reader, that the warmth of the skin should never depend so much on

any particular kind, or amount of clothing, *as on its own tone, and the active performance of its functions—its vigorous circulation, and the great chemico-vital changes effected by it.* By a system of coddling, and flannel, under clothing, this desirable condition is, in a great measure, interfered with; and a constant tendency to the opposite one, of morbid sensitiveness, is kept up. Frequently I have observed, how soon, however, and after the use of a few water processes, all unnecessary under flannels can be thrown aside, without harm; showing the great benefit from the former, and the utter uselessness of the latter, in many of those who wear them.

But it is not to be presumed, that a few water processes will enable every patient, to throw aside his flannels at once. Many present themselves for treatment, who labor under severe congestion of the internal organs, and in various degrees of internal irritation; and with the skin, withal, bloodless, but morbidly sensitive, and which has been wrapped in flannel for many years. For some of these, even the water of the baths, needs, at first, to be raised many degrees above its common temperature: and we have to persevere for weeks, before the withdrawal of unnecessary flannel can be safely accomplished. This being done too soon, would increase the internal mischief; and causing also much uncomfor-
 tableness of physical feeling, it would disturb the brain, and the whole system. The feelings of the patient frequently afford a good criterion, by which the propriety of the change may be determined. It is a common mistake of *amateur* hydropathists, to suppose that the circumstance of becoming a water patient, is a sufficient

reason for casting aside all flannels at the commencement of treatment: but such a conclusion is very erroneous; and the practice would be often productive of much injury.

The night clothing of the water patient, whilst asleep in bed, ought also to be attended to. Because of the recumbent position which we assume in bed, in order to afford the greatest support and rest to the body, we consume a less quantity of oxygen; and a greater inclination to sleep is promoted by this circumstance: in this also the action of the lungs is diminished, although the other internal functions of the body are increased. The action of the skin is also increased during sleep, and the insensible perspiration becomes of a more concentrated and acrid nature, and is more sensible to the smell. Bichat has stated erroneously on this subject, that "the skin appears to be struck with a kind of atony; and it cools much sooner, *and allows less fluid to escape from it,*" Bichat tom II p. 513. Yet, as just stated, the secretion of the skin becomes of larger quantity: and its sensibility is also increased, and more clothing is required than in the waking state. However, care must be taken in regard to this, to avoid excess of bed clothing; for this becomes decidedly injurious: and as in the waking position, the evil will consist in providing artificially for the heat of the surface of the body, which ought always to depend on its own tone, and the vigor of the animal frame, and the chemico-vital changes, as already stated.

In the Water Cure, all external means of warmth to the body are to be dispensed with, as much as possible, and, especially, is the use of flannel to be discontinued,

as soon as the restored tone and activity of its surface will permit: for, assuredly, the due exposure of it to the atmospheric air, is one important part of the treatment. The less this is interfered with, the more rapid will be the progress made in the cure. The *innate power of the organism* is raised to its normal, and healthy standard, by the means and appliances of the Water system conjointly; and it alone is the legitimate source of animal heat, as it is also of the health, and well being of the animal economy.

The subject, in its general application, is of great moment; and notwithstanding that so much has been written concerning it, there yet remains much misunderstanding regarding the suitable clothing for individuals, under the various circumstances of life;—the habits—the age—the constitution,—also the climate and the season of the year: on few subjects has there been more discrepancy of opinion than on this. There are two or three points, to which I would briefly direct the attention of my reader, and because of their important bearing on health.

Firstly, I allude to the nature of the under-dress in immediate contact with the skin; and shall then refer briefly, to the monstrous custom of tight clothing of any kind, either as ligatures to the limbs, or to the neck in males, or to the so much practised habit of tight lacing amongst females. Medical men are still divided in their opinions respecting the use of flannel next the skin: but they are unanimous in deprecating all tight clothing; and more particularly have they condemned tight lacing in females; and with good reason, because of the evil effects of it being constantly brought to their knowledge.

As to the first point of under garments; as of most other things in this world, we see the proper use, and the hurtful abuse of them. Perhaps there is no part of hygienic means, whose regulation is more subject to proper variation, because of the various circumstances of the individual:—what may be indispensable for those of one, would be preposterous and harmful for another; and even for the same individual, there will be need of considerable alteration of clothing, according to his habits, and other varying circumstances. Much has been written very unadvisedly against all use of flannel next the skin. Whereas, there are certain peculiarities of the human constitution, such as I have frequently seen, with the external connections of occupation, in which it could not be dispensed with, without the consequent evils of disease of serious nature; and ultimately, even of death itself. It cannot be doubted, that above the lower ranks of society, the error is usually on the side of excess of flannel: and equally true is it, that amongst the labouring class, the far more extensive use of it to the surface of the body, would be preventive of many serious diseases, which frequently afflict them. Its influence is that which is most adapted to the occupation of this class of men:—it preserves the equable temperature of the surface of the body, under the varying circumstances of daily labor, which causes free perspiration; and without its use, I have constantly found them more liable to those diseases arising from the obstructed function of the skin,—internal inflammations,—fever of different kinds,—and rheumatism; and on numerous occasions I have removed this liability, by ordering the constant use of flannel; but always with the particular

injunction, that it be frequently changed, and be kept quite clean, according to the season of the year, or the severity of the labor that it may be their lot to undergo.

With regard to those of higher grades of society, and who are free from compulsory labor, there is not the same necessity for wearing flannel under garments; and only in urgent circumstances would I recommend their use: far more frequently, that they be of cotton, will be preferable; and in the majority of individuals, and especially in those of youthful age, and of vigor and health, up to middle age, I would strongly advise, that no under garment whatever be worn. The only justifiable reason for adopting either flannel or cotton, must be in those of peculiarity of physical constitution, and of great liability to diseases from obstructed perspiration:—such are they of scrofulous tendency, and those of predisposition to rheumatic and pulmonary affections. It will be a much better plan, to aim at fortifying the skin; and through it, the whole system, by air, exercise, and diet, with the constant use of proper hydropathic processes, as prophylactic and hygienic measures. These observations on the use of flannel, according to circumstances, and condemnatory of the sweeping doctrines of certain writers, who deal more in theory than in experience, have a full illustration in the experience of our soldiers and sailors; and more particularly of the latter, whose whole lives are passed under the most variable, and trying circumstances on shipboard, in exposure of all kinds and degrees of climate, and weather. It is very gratifying to reflect on the very great improvement in the health, and efficiency of these brave fellows of the present day, compared with those of by-gone times; how

much has been achieved in the adaptation of science, for the betterment of their condition. Amongst other excellent means,—of diet, and of cleanliness, and ventilation, the adoption of flannel under-garment is of great utility. Not less evident have been the great advantages of the same use of flannel in the army. How much of the sad disasters of our warriors in the Crimean campaign of last winter, would have been prevented and diminished, could every soldier there have had the surface of his body covered with flannel! How many thousands would have thereby escaped rheumatism, and dysentery, and death! This means would have proved much more effectual than all the chalk and opium made use of; and would have been more in accordance with the principles of true science,—the dictates of physiology and pathology.

We will here notice, in a few words, the very injurious notion which has possession of the minds of many mothers, in the higher ranks of life,—that their offspring should be reared in all possible hardness, in order to endure all vicissitudes of weather: for this, too, they cause their young children to be taken out quite uncovered, as to their necks, and breasts, and extremities; and in the coldest weather. This is a very hurtful practice, and renders the child of infantile age, much more liable to disease. It is to the great susceptibility to cold in children, that may be ascribed the great mortality amongst them:—again, “*nunquam aliud natura, aliud sapientia dicit*”—nature never says one thing, and wisdom another—These mothers may learn a lesson from animals on this subject; in which nature and instinct are wiser than reason. See the birds;—how,

carefully do they provide against cold for their young ! And indeed, the whole race of animals,—as correctly remarked by the philosophic Edwards “L’instincte porte les mères a tenir leurs enfans chaudement. Des philosophes par des raisonnemens plus ou moins specieux, les ont engagées a différent epoques, et dans divers pays, à s’écarter de ce principe, en leur persuadent que le froid extérieur fortifierait la constitution des enfans, comme il fait celle des adults.”

The practice of tight dressing, in every particular, is properly condemned by all medical men. The infamous stock of the soldier has been, too long, a most severe infliction of evil on him ; and every approach to tightness of neckcloths, in any one, is both disagreeable and dangerous. The application of a tight garter to the lower extremity, is a likely means for producing varicose veins, and ulcers, in those who are constitutionally predisposed to these evils. Tight shoes, or boots, are of very injurious tendency, and much beyond the calculation of those who wear them. This is a much too common evil, and is liable to extend its influence far beyond the production of corns, and deformity of the toes : it has, indeed, an injurious effect on the whole nervous system, in its disturbing power ; more particularly, on the brain and the stomach.

The worst of practices in tight dressing, is that of tight lacing in females : and the effects on the individual have been again and again described by writers on the subject : but properly to understand them, it is necessary to know something of the structure of the chest in females, as well as of its motions in the act of respiration. It is a common mistake, to suppose that

the waist, in proportion to her size, is smaller in woman than in man: it is only apparently so. We should view it with the pelvis, and the chest, which are broader in the female than in the male sex. The female pelvis is known for its breadth; but it is not known to many, that her chest is also broader than that of man. It is much broader anteriorly; but it is not in the space between the ribs, and within the chest; it is in the lengthened clavicles, or collar bones, which throw out the shoulders, and give space for the perfect development of the *mammæ*, or breasts. The natural form of woman is perfect in elegance and power, without the least need of stays; this perfection, however, consists not in the *slimness*, which a perverted taste prizes so highly, and endeavors to procure, by artificial, and very hurtful means of tight lacing. By this, the chest is thrown out anteriorly, also the abdomen, and she becomes unhealthy. By natural formation, her chest should be wider from side to side, than from before to behind; but this proportion is altered by tight lacing, and the sides are forced nearer to each other, and the chest is reduced to a round shape: its lowest part becomes most compressed, whilst its upper part, and the abdomen, are protruded. The manner of the projection of the abdomen can only be correctly understood by a close consideration of the act of breathing, and the dilatations of the chest, during the time of it. These dilatations during respiration, are of three different kinds—from side to side—from before to behind—and from above to below. The two first are connected, and are the most extensive movements, and the most important in the function of the lungs. The action of the intercostal muscles raises the ribs, and their

lower edges are turned forward and outward; whilst by their connection with the sternum, or breast bone, they tilt it also forward, at its inferior part. Such is the movement of the chest, transversely and forward, in breathing. During the same time, the action of the Diaphragm, or midriff, is producing the perpendicular movement of the chest.

By girding the chest strongly with stays, the transverse and forward movements are impeded, or entirely destroyed; and the deluded female, influenced by false taste, breathes by the action of the diaphragm alone, and in the perpendicular movement of her chest. This is also the compulsory means of an individual with fractured ribs, who has been tightly bandaged by his surgeon, for the proper purpose of preventing their motion; the patient, indeed, dare not breathe as usual, because of the pain immediately caused from displacing the fractured bones. Although the narrow limits of my treatise demand all possible brevity, I am induced by consideration of the importance of this subject, to enlarge a little further, to consider the consequences of tight lacing. By it the female breasts are compressed, and confined; and are often so much flattened, that their proper function, at the proper period, is found seriously affected, and injured.—In Baynard's History of Cold Bathing, we read “these deficiencies in a mother are chiefly owing to her parents, who must have Miss fine and tight lac'd, for a *slender* waist, or a *Ball*, or a *dancing Bout*, &c.; hence the nipples are squeezed in, and the whole breast laid flat when young. Thus the glands are pressed, and injured, and made incapable *fungi officio* in lactifying and sweetening the

blood into that delicate *juice* called milk ; and sometimes worse accidents attend these tight lacings, as Cancer, Schirrus, and hard Tumours in the Breasts."

We must consider, that under the unnatural circumstances of the diaphragm having the main work of respiration to perform, its action in its lower descent, must necessarily press forward the parietes of the abdomen, which are the most yielding part : and this unusual pressure must cause derangement and disease in the internal viscera. It must be evident to my reader, that constant pressure on important organs, such as the liver, stomach, and duodenum, must greatly impede their function, and become a constant cause of indigestion, with all its attendant evils. And we have to consider the effects of this pressure from tight lacing, in another serious mischief:—it necessarily prevents the due expansion of the lungs, and causes the breathing to become quick and short. Further, the due quantity of atmospheric air cannot be admitted into the lungs, and the blood is not properly acted on for its oxygenization ; and this may lay the foundation of the most fatal diseases. My reader will now be competent to appreciate the effects of such a cause, after his perusal of the previous treatise. In addition to the pressure on the digestive organs, this interference with the function of the lungs, must be of direful effect ; and, to the list of ailments of the liver, stomach, and duodenum, and the uterine system, we have to add those of the lungs ;—*hæmoptysis* and *phthisis* : also *spinal disease*.

We will just take a glance at the last named evil consequence belonging to tight lacing, ere we leave it ;—*the production of spinal disease—crooked and deformed*

spine. The muscles of the back, whose office is, to give support to the spine, are of very powerful kind, when duly and properly exercised: they may be accounted the main stay of the body, in all its movements. As remarked by Dr. Kilgour, in his excellent lectures on therapeutics and hygiene, "when Miss is bound in stays, these muscles, like those of a bandaged leg, are diminished in size and strength; and she certainly has a slimmer body: but no mechanical contrivance of support is equal to God's handiwork: stays are not equal to muscles. Misse's head, though in one sense perhaps light enough, is now too heavy for her vertebral column to bear, and she bends under it, or, if she will add accomplishments to a slim waist, leaning over the harp, or the portfolio, she speedily gives the spine, now composed merely of bones slightly bound together, a hitch to one side."

Spinal deformity is less frequently found in the male, than in the female sex;—seldom amongst boys, but often amongst young ladies at boarding schools. The reason of this is not to be found in any original deficiency in the anatomical structure of the female. The works of God are ever perfect; and it is ever the ingenerate folly and wickedness of man which become the cause of any interruption of the harmony, the beauty, and the perfection of the human body, and the wonderful adaptation, which is seen in it, between the means and the end, which his omniscience and goodness have established. The cause of so much spinal deformity in the female sex, is, undoubtedly, in the habits and contrivances she endures in civilized life; and which are totally unknown amongst the less civilized: yet *there* she is most seen in her original

symmetry, and loveliness of form ; and perfectly competent to weather the severities of her lot. It is well known that in savage life, it is usually more laborious than that of man. But, wherever the benign and ennobling spirit of christianity is unknown, we find woman more or less trampled on ;—the rightful dignity of her social position is not seen ;—she becomes the slave of her imperious tyrant, man—to drudge in his service ; instead of being the honored and endeared wife of his bosom ; yet, through all the hardships of her barbarous position, her physical power continues equal to it, without the aid of artificial means.

A slight difference is certainly seen in the structure of her spine, compared with that of man : in him, the articulating surfaces of each vertebra are broader, and are held together by stronger ligaments, and the stronger tendons of muscles ; and this arrangement adapts him more for the lot of labor to which he was appointed, by divine decree, at his fall,—“ *In the sweat of thy face shalt thou eat bread, till thou return unto the ground.*” In the spine of woman, these articulating surfaces are smaller, and the ligaments are less strong ; but the comparatively weaker joints of her spine have a full compensation in the muscles, by which a fineness of poise is given, through her governing nervous sensibility : when these muscles are reduced by disuse, or this sensibility is injured, her physical power must be, in proportion, also diminished ; and her spine becomes liable to distortion. In cases of only partial diminution, I can conceive of no remedial means comparable with skilfully directed water treatment, for its restoration ; whatever other means may be deemed needful, conjointly,

for preventing further distortion of the spinal column, before the muscles acquire their proper bulk and power. The different water processes, regulated to the circumstances of each case, will be found the most efficient means for correcting the tendency to spinal deformity, and for restoring to the female form, to the utmost possible extent, its natural endowment of attractive elegance ;—and to render it physically competent, without mechanical support, for the duties of her station of life.

In this treatment, the hydropathic physician will ever keep his mental eye fixed on the morbid state of the digestive and blood-making organs, as the original efficient cause of all the mischief in the cases of spinal affections ; and the restoration of their healthy function will be the paramount object to be obtained. For this, he possesses in the Water Cure, the means incomparably superior to the usual methods which, of late years, have been practised, and so much published, for these complaints. My reader I trust, is now prepared to form his own estimate of all treatment which consists principally in mechanical contrivances, and long confinement in the recumbent position of the body, for the cure of spinal distortion. He will now comprehend, that in these cases, the most urgent want of the animal frame must be a normal state of healthy digestive and nutritive function,—for the formation of healthy blood, from which is to be formed healthy muscular tissue, and the healthy osseous material required in the structure of the vertebrae of the spine. He will now, also, be prepared to appreciate the connection, as cause and effect, between tight lacing, with boarding school life, and spinal disease.

He will readily perceive, that constant pressure on the stomach, duodenum, liver, and bowels, with the additional evil of wrong diet, becomes an abundant cause of all the results to the unfortunate inmates of such institutions. But, to this must be superadded the evil effect of deficient respiration on the quality of the blood; and this, also, in an impure atmosphere: so that the *ensemble* of predisposing and exciting causes of spinal diseases at such places, must be powerful.

F I N I S .

ERRATA.

Page 12 — line 9 for $\tau\epsilon\iota\nu\epsilon\omega$ read $\tau\epsilon\iota\nu\omega$.

51 ——— 18 — of — and.

66 ——— 20 after performed, insert partly.

——— 22 for as read again.

82 ——— 12 — glorie — gloire.

130 ——— 13 — $\alpha\nu\tau\omicron\upsilon$ — $\alpha\upsilon\tau\omicron\upsilon$.

131 ——— 7 — principia — *Principia*.

189 ——— 15 — after — during.



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